JANUARY, 1955

American Engineer

IN THIS ISSUE . . .

- An Exclusive Interview with VAL PETERSON

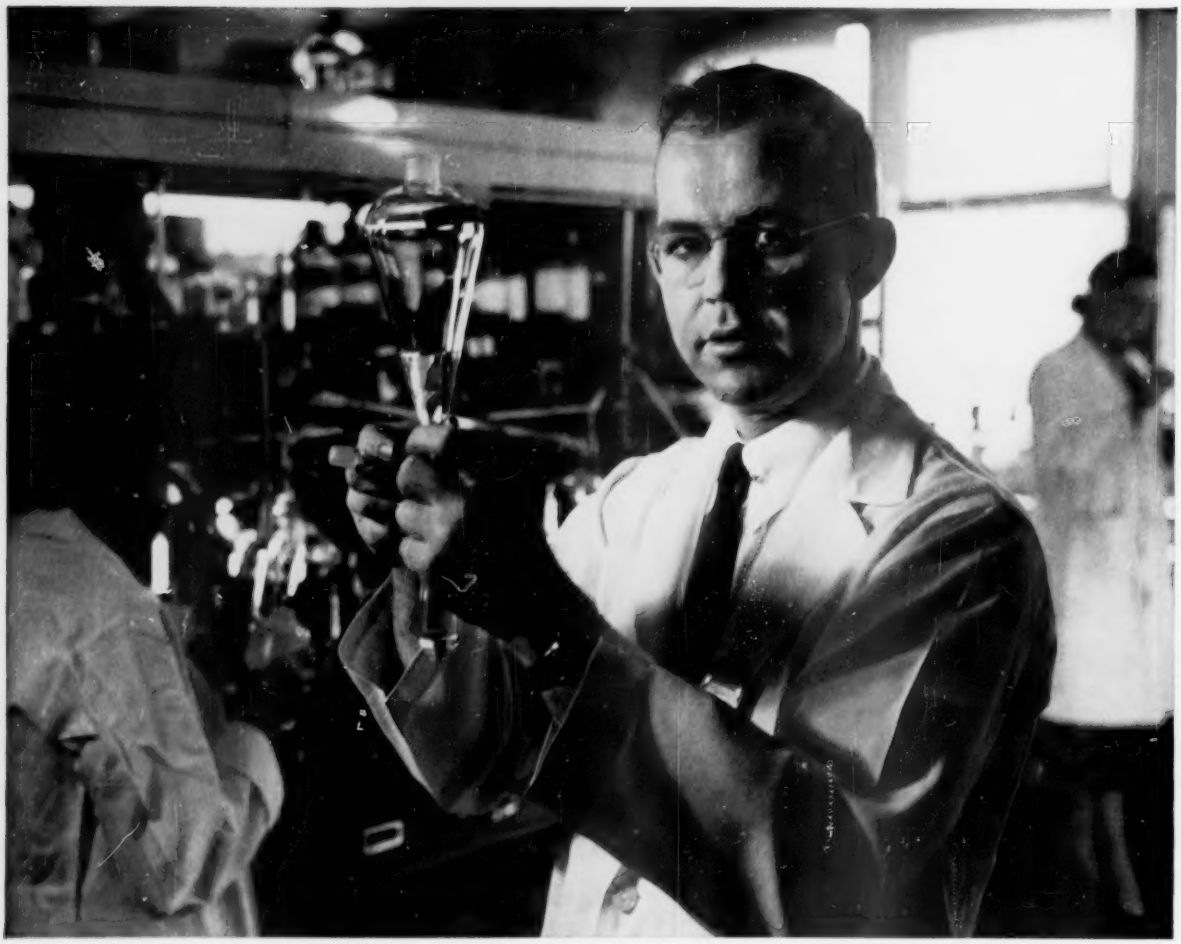
Federal Civil Defense Administrator

Administrator Peterson Points to Engineers As the Vital Link in the Civil Defense Effort

. . . *Also*

Corporate Professional Practice vs. Individual Professional Practice • The Satisfaction of Invention • Late Capitol Hill Report and Professional News

Twentieth Anniversary Issue



PHOTOGRAPH BY RICHARD BEATTIE

What we still don't know about cancer

—and one of the reasons why

IN THE PAST FEW YEARS, our knowledge of the nature of cancer, and how to treat it, has grown encouragingly. Patients, who would have been considered hopeless cases even five years ago, today are being completely cured. And even those who apply for treatment too late can usually live longer—and less painfully—because of modern palliative treatment.

All the same, there have been defeats as well as victories. We do not know—to take a single example—why so many more men are now dying from cancer of the lung. In 1933—just twenty years ago—lung cancer killed 2,252 men; in 1953, some 18,500. That's a great increase—which even our expanded population, and other known factors, can't possibly account for in full.

Well, why haven't we found more of the answers to cancer?

Not only because cancer is an immensely complex problem: difficult to diagnose, and difficult to treat; challenging to the best research minds.

All that is true enough. But there is another reason: *we do not* have enough money.

Last year your gifts to the American Cancer Society were more generous than ever before. But they were not enough.

You gave the Society almost twenty millions to fight a disease that—at present death rates—will kill twenty-three million living Americans.

Less than one dollar for each American destined to die from cancer. Much more is needed for research, for education, for clinics. Won't you please do *your* part . . . now?

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American Engineer

JANUARY

1955

American Engineer
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1935 – 1955

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• SPECIAL ARTICLES

An Interview with Val Peterson — 9
The Federal Civil Defense Administrator relates in answers to questions just what engineers are and are not doing in this important field.

The American Engineer Is Twenty Years Old! — 14

The Satisfaction of Invention — 16
By Richard F. Harvey, P.E.

Corporate Professional Practice vs. Individual Professional Practice — 18

• REGULAR FEATURES

Letters — 4
Professional News Briefs — 6
From Washington — 25
Professional Postscripts — 27
Book Looks — 30
NSPE Believes—The Profession in Nat'l. Security — 32
With Our Members — 33
Strictly Business — 39

Professional Directory — 34, 35, 36, 37
Classified — 38
New Literature and Advertisers' Index — 41
What's New—New Products of Interest — 42

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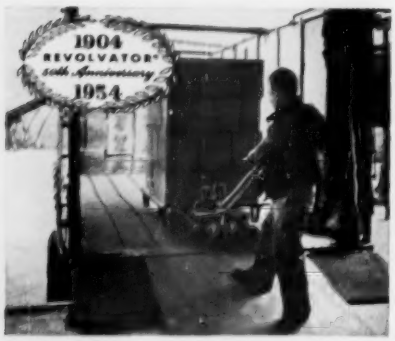

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Letters to the Editor

Two-way Street . . .

Dear Editor:

The NSPE Annual Report for 1954 states, "the professional engineer-employee has a responsibility of loyalty to his employer and should notify his employer of his desire for a change in employment . . ."

I assume this refers to what we were taught in the early twenties, and apparently still is taught, that the ethical thing is to give one month's notice to your employer that you have accepted employment elsewhere, so that replacement may be trained.

A young friend of mine followed this policy recently and was promptly fired as of the end of the week.

The young engineers should be warned of such occurrences, since they occur not only in the small companies but even in the largest ones, with large employee relations departments.

Experiences such as these explain why "thirty-four per cent of engineers . . . believe in collective bargaining agencies . . . Most of them . . . within the twenty-five to thirty-five age group." (Executive Research Survey Number Three, as published by the NSPE.)

CHESTER E. ROSE, P. E.
Metuchen, New Jersey.

Status of the Profession . . .

Dear Editor:

I am a new member of the professional engineers organization and received as part of the literature with my membership card, the May issue of the AMERICAN ENGINEER, containing an article by Major General Samuel D. Smith Sturgis, Jr., entitled "Have We Lost Control of our Profession."

The article expresses the opinions of a man not engaged in civil practice as a professional engineer, nor apparently familiar with the fact that engineering requirements in nearly all fields today are requiring better engineering, are more competitive in design and certainly, under a great many circumstances completed under the most urgent press of time. It is these very facts that make it possible for the civilian engineer to pick up the load that is required of him during time of military mobilization.

It is indeed unfortunate that a man in the position of the Chief of Engineers, not a policy making post at all, should attempt to tell the voter and taxpayer that the Federal Government has permanently taken on the status of the profession's biggest customer. God forbid!

It is perhaps even more important that the private engineer be familiar with and take part in what General Sturgis calls our civil works projects. In a profession where the services are strictly personal and their value depends upon the experience, integrity and capabilities of the engineer, there is in all cases several solutions to even our water problems; in fact nearly as many solutions as there are engineers working on the problem. It is indeed unfortunate that the Chief of Engineers feels that, in the selfish interest of his organization, the civil works projects should be limited to the study and the answers proposed by that organization, when in fact we know from experience that better solutions at less cost

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would result from active interests in the problems by many civilian engineers in private practice.

Perhaps we are losing control of our profession. Certainly, if what the Chief of Engineers proposes is in fact the case, we already have a monopoly that in private practice would be justly accused of procedures that would be liable under the Anti-Trust Act. Perhaps medicine is not the only field in which we are bordering on socialization. Let's hope we have not lost control of our profession!

L. D. McDonald, P. E.
Kansas City, Mo.

On Poems . . .

Dear Editor:

. . . (Dr. Steinman's) inspiring poem in the American Engineer, October, 1954, "A Bridge of Peace," will strike home to the heart of every parent.

May I suggest two stanzas, to precede this flawless interpretation of man's ambitions?

First Stanza—Religious Unity.
Second Stanza—World Unity.

Today our world is small; any event half way around the world is of as much interest as an incident in our own back yard. World unity and religious unity seem only a matter of time.

It would appear that in place of tolerance we should substitute understanding, not only in our world-wide business relations but include the peoples of the world also.

George D. Hartley

The P.E. in the U. S. . . .

Dear Editor:

My friend and colleague Leonard Lasky has made some rather perplexed commentaries upon the existence and purpose of so many engineering societies and related groups. (American Engineer, November, 1954, page 3.)

Perhaps the fact that we live in a society outstanding by a not well-defined urge on the individual to join groups and being identified as a member and the fact that the heterogeneous field of engineering is far from achieving the stature of the other learned professions, may provide an answer to Lasky's reflections.

We have not learned yet that engineering may constitute the most universal of languages knowing no geographical or other barriers. Instead we expect that a Professional Engineering Society divided for purposes of functioning and membership into State organizations and County Chapters will be the instrument to bring public recognition for us and develop a solution to the great problems confronting our profession. The net result is a tremendous waste of functions and repetition that happens at all levels and conflicting policies that until now have done nothing to elevate our professional prestige.

Nowhere is evident an effective and constructive approach to bring about Government recognition for our status. For example, only recently the Small Business Administration ruled that independent engineers, for being classed with the rest of professionals such as doctors, lawyers and ministers, were not to be entitled to financial assistance from that agency, not even in the case of projects directly connected

(*Continued on page 40*)

HALF the world is half asleep! Men who could be making *twice* their present salaries are coasting along, hoping for promotions but doing nothing to bring themselves forcefully to the attention of management.

They're *wasting* the most fruitful years of their business lives . . . throwing away thousands of dollars they may never be able to make up. And, oddly enough, they don't realize—even remotely—the tragic consequences of their failure to forge ahead while time is still on their side.

These are the men who are unknowingly headed for the frustrations and the disappointments of mediocrity. They'll go part way up the ladder and down again by the time they're fifty years old. They'll be executive material in their twenties and thirties—and clerks in their fifties. They'll have high hopes for themselves and their families while they're young; but only struggling, skimping and regret later on when their earning power should be at its height.

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PROFESSIONAL NEWS IN CAPSULE FORM

A Round-up of Late Events for Professional Engineers

C. S. Leopold Receives Award

Charles S. Leopold, prominent Philadelphia heating and air conditioning engineer and a member of the Pennsylvania Society of Professional Engineers and NSPE, has been named to receive the F. Paul Anderson Medal. The medal, which is the highest award accorded by The American Society of Heating and Air Conditioning Engineers, will be presented to Mr. Leopold during the Society's 61st annual meeting scheduled to open January 24 at the Bellevue-Stratford Hotel in Philadelphia.

The organization was formerly known as The American Society of Heating and Ventilating Engineers, but the name has been changed recently in accordance with the wishes of an overwhelming majority of its members as indicated in an official vote.

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Engineers Called to Politics

New York State Senator Thomas C. Desmond has urged engineers to participate more actively in political affairs, not only working on the local level, but also seeking state and national offices.

"Better politics, better statesmanship, more in accordance with high engineering standards of truth, intelligence and reason could produce a better world," affirmed the Senator in the Roy V. Wright Memorial Lecture which he delivered at the recent annual meeting of the American Society of Mechanical Engineers in New York City.

Senator Desmond, whose address was entitled "A Call for Engineers in Policy-Forming Political Positions," is a member of the New York State SPE and NSPE. As a result of the November elections he is also entering his twenty-fifth consecutive year of service as a Republican member of the New York State Senate.

❁

Alois W. Graf Honored

The Institute of Radio Engineers has elected Alois W. Graf, prominent Chicago engineer and patent attorney, to the grade of Fellow "for his contributions to the radio engineering profession." Mr. Graf has long been active in professional as well as technical activities, and he is also vice president elect of the Chicago Chapter of the Illinois Society of Professional Engineers.

❁

Chief Engineer: "I suppose you realize, Parkins, this automatically cancels your bonus."

Engineers and Highways

America can definitely catch up with its highway needs within the next twenty years if proper use is made of available financing, engineering, and construction facilities, Francis L. Brown, partner in Brown & Blauvelt, New York consulting engineers, stated recently.

Mr. Brown, a member of the New York State SPE, offered his comments while serving as moderator of a panel on highway engineering during a highway safety conference sponsored in New York by the Institute for Safer Living.

He also asserted that trained psychologists can offer highway engineers help in the solution of many currently troublesome design problems. "One of the fundamental needs in highway design," he said, "is to adopt to the design the limitations of the average person's reactions under the stress of modern highway travel."

❁

Engineer-Inventor

Carl W. McPherson of Phoenix, a member of the Central Chapter of the Arizona Society of Professional Engineers, has recently joined the ranks of engineer-inventors with his application for a patent on a new automotive fuel system and the signing of a contract for manufacture with Vanell, Inc., of Burbank, California.

It is claimed that the invention, a replacement for the present gasoline carburetor, will give tremendously increased mileage per gallon and improved engine performance because of "nearly perfect combustion."

Mr. McPherson is a bridge designer for the Arizona Highway Department. He has been joined in his work on the new fuel system by Solomon P. Scholl, shop superintendent of the Concrete Conduit Co. in Phoenix, and the invention is being termed the McPherson-Scholl Fuel System.

❁

Noteworthy Achievement

Robert W. Adams of Waban, Massachusetts, a member of the Massachusetts SPE, has recently been elected a Fellow of the American Association for the Advancement of Science. Mr. Adams had gained earlier special rec-

ognition for his efforts as chairman of a joint committee of architects and engineers which, in 1952, formulated the Interprofessional Code of Practice now effective in Massachusetts.

❁

Soviet Science Study

New York's Carnegie Corporation has announced a $20,000 grant to the Massachusetts Institute of Technology for a study of Soviet advances in scientific and engineering education. "The recently published fact that the USSR is currently turning out twice as many scientists and engineers as the United States gives an added urgency to the study," Carnegie officials stated in making the announcement of the grant.

❁

Herron Takes New Office

Lewis F. Herron of Cleveland, Ohio, president of the James H. Herron Co. and an active member of the Ohio Society of Professional Engineers, has been elected president of the American Council of Independent Laboratories, Inc., for 1955.

He is also chairman of the Cleveland District of the American Society for Testing Materials and chairman of the Zay Jeffries Committee of the American Society for Metals. In addition, he belongs to the American Institute of Mining and Metallurgical Engineers, the American Foundrymen's Society, and the Society for Experimental Stress Analysis.

❁

Outstanding Young Electrical Engineer

Ruben F. Mettler, 30, of the Hughes Aircraft Co., Culver City, California, now on loan to the Department of Defense in Washington, has been named the outstanding young electrical engineer of 1954 by Eta Kappa Nu, electrical engineering honor society.

Cited for "his outstanding planning and development of air defense control systems, his participation in civic affairs, and his various artistic attainments . . .", Mr. Mettler will be presented with the Eta Kappa Nu Recognition Award at the annual banquet of the Society on January 31 at the Statler Hotel in New York. The banquet will be held in conjunction with the winter general meeting of the American Institute of Electrical Engineers.

❁

Engineer Advances in Civic Service

Paul E. Shaad, a prominent member of the California SPE and NSPE, has recently been appointed assistant general manager and assistant chief engineer of the Sacramento Municipal Utility District.

Mr. Shaad, who is an honor graduate of the University of Kansas, is also an active member of the American Institute of Electrical Engineers, Tau Beta Pi, Sigma Tau, and other technical, professional, and civic groups.

❁

Chemical Progress Week Is Being Planned

The second Chemical Progress Week has been scheduled for May 16-21, 1955, according to an announcement made in Washington, D. C., by the Manufacturing Chemists' Association, sponsor of the event. "The purpose of the week," said William C. Foster, MCA president, "is to

(*Continued on page 8*)

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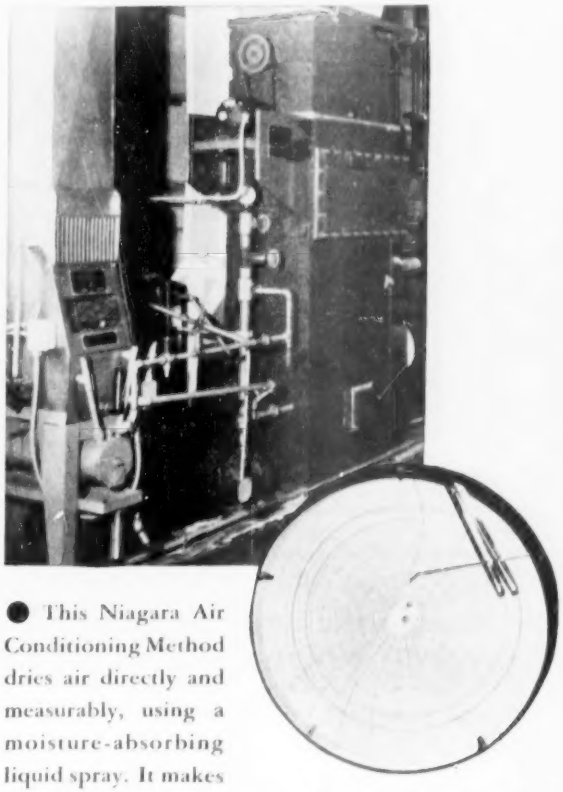

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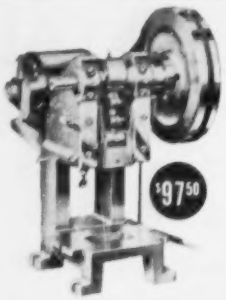

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Briefs

(*Continued from page 7*)

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❁

Meetings of Interest to Engineers Are Scheduled

Recently-announced meetings and conferences of interest to professional engineers include:

The 41st Illinois Annual Conference on Highway Engineering, University of Illinois, Urbana, Ill., March 1-3, 1955.

Consecutive annual meetings of the American Congress on Surveying and Mapping and the American Society of Photogrammetry, Hotel Shoreham, Washington, D. C., March 7-11, 1955.

Annual Meeting of the American Society for Engineering Education, Pennsylvania State University, State College, Pa., June 20-24, 1955.

❁

Gen. Prentiss at Ft. Belvoir

Brigadier General Louis W. Prentiss, formerly Engineer Commissioner of the District of Columbia, has taken command of The Engineer Center, Fort Belvoir, Virginia, and also received a promotion in rank to major general with the new assignment.

At Fort Belvoir, he succeeds the late Major General Arthur W. Pence, who succumbed to a heart attack November 8. General Prentiss is being followed in the District of Columbia post as Engineer Commissioner by Colonel Thomas A. Lane.

In commenting on the selection of General Prentiss for the Fort Belvoir post, Major General S. D. Sturgis, Jr., Chief of Engineers, pointed out that: "At the present time Fort Belvoir is the most important military field installation of the Corps of Engineers and, in this era of rapid changes, it is vital that The Engineer Center be commanded by an officer thoroughly alert to the changing requirements of the Army and its Corps of Engineers, as well as to the impact of these requirements upon the civilian economy. General Prentiss is firmly grounded in these prerequisites."

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Worcester Polytechnic Head

Arthur B. Bronwell of Wilmette, Illinois, a well-known electrical engineer and professor at Northwestern University, Evanston, Ill., has been named president of Worcester Polytechnic Institute, Worcester, Massachusetts. The new president has long been active in professional, technical, and educational circles, and has most recently been serving as secretary of the American Society for Engineering Education. He is resigning from the latter office in assuming his new duties.

❁

Detroit Tech Dean Retires Next Month

Dean Clarence C. Winn of the Detroit Institute of Technology will retire in February after having headed the school's Engineering College for thirty-one years. In recognition of his services the title of Dean Emeritus of Engineering has been conferred upon him by the board of trustees. He will continue to teach and counsel after his retirement.

❁

Dodge Will Head AICE

Dr. Barnett F. Dodge, head of the Department of Chemical Engineering at Yale University, will be the new president of the American Institute of Chemical Engineers, according to a recent announcement. Dr. Dodge succeeds Dr. Chalmer G. Kirkebride, president of the Houdry Process Corporation, in the office.

❁

Kushnick Named to ISA Post

William H. Kushnick has been appointed executive director of the Instrument Society of America and has taken over his new administrative duties at the national office in Pittsburgh. A graduate of the School of Industrial Engineering of New York University, Mr. Kushnick was formerly director of the School of Management of the American Management Association in New York.

American Engineer

The Magazine of the Registered Professional Engineer

VOLUME TWENTY-FIVE, NUMBER ONE

An EXCLUSIVE INTERVIEW with

VAL PETERSON

Federal Civil Defense Administrator

Q. Reporting in the AMERICAN ENGINEER a little more than a year and a half ago, L. L. Dresser, a former president of the National Society of Professional Engineers who had been an observer at the Yucca Flats atomic bomb tests, wrote as follows:

"And as I stood there, watching the hours and then counting the minutes and then the seconds until zero hour, I began to realize that to an engineer, the atomic bomb is an even greater challenge than to the average citizen who is seeking survival only for himself, his family, and his friends. It is an enormous challenge because the engineers of our world hold the key to preparations. All types of engineers—from the construction to the sanitation—must work together to prepare to offset the disastrous effects of an atomic blast on lives and property."

With the greatly magnified danger occasioned by the hydrogen bomb, we realize that the situation is even more acute. We are concerned about the often-reported lag in civil defense preparations especially on the local level in many areas and we would like to have your comments on this.—To what degree is the distressing lag due to the lethargy of technological men?

A. You are rightly concerned about the lag in civil defense preparation on the local level in many areas. While the technological men can hardly be held responsible for this condition to any greater degree than the local leaders and the public generally, they are, perhaps, in a better position to understand the implications and impact of atomic warfare and are thus in a potential position to assume a greater degree of leadership in the over-all effort. To this extent, they may be subject to more criticism for their lack of action than the laymen who might not be expected to have as comprehensive an understanding of the problem.

Q. What action would you advise the professional engineer seriously concerned about civil defense to take in his community if CD plans are lagging there? How can he promote CD preparedness both as an individual and as a member of a professional and civic-minded group?

A. In communities in which plans are lagging, the professional engineer who is seriously concerned about civil defense should consult with the civil defense and Governmental heads of the community, to ascertain what the attitude is toward the problem and what plans are being made to bring about an effective program in the many areas of civil defense, such as evacuation, shelter, radiological monitoring, fire fighting, rescue, evacuee housing, emergency sanitation, and other areas requiring technical support. He should attempt to learn more of the effects of a nuclear attack upon his community and, with his technical knowledge and understanding of the problem, seek to impress upon the leaders in his community the necessity of establishing an adequate civil defense organization and educating and training the public in the need for their active interest and participation.

Q. Would you briefly summarize the main responsibilities of the engineer in civil defense in the so-called metropolitan target areas? And what are his responsibilities in the smaller community?

A. The engineer shares equally in the responsibility of all citizens for creating adequate civil defense organizations and operating plans, and educating and training the public in the necessity for acceptance and active participation therein. Each individual in the community has at stake his life, that of his family, and the continued existence of his country under an acceptable standard of living. In addition, the engineer has the responsibility inherent in his profession—that of analyzing the many technical problems involved, the studying-out of practical solutions, and the selling of the program to the lay public.

He has this responsibility to the public in the technical phases of civil defense in the same degree, for example, that he does in promoting safe building construction under adequate codes. The public accepts the rules and regulations developed by the engineering profession in this area without question, as being necessary for their safety and general welfare. They must be made to understand that technical civil defense preparations fall into this same category and that they must accept such plans on the same basis. While in many persons' minds the likelihood of being bombed by an enemy is remote, they must be made to understand that the possibility of this bombing is very real and that, should it come, lack of preparation could be disastrous to all aspects of American living held dear by the individual and the family.

In the metropolitan target areas, the engineer is confronted with a greater number of problems, and problems of a greater magnitude than in the smaller community that is not likely to be subject to the direct effects of a nuclear explosion. The highest priority problem for the metropolitan area is probably the technical aspects of evacuation, involving an adequate warning system, traffic studies, route selection, route improvement, route markings, transportation media, and housing, sanitation, and water supply for evacuees at suburban or rural reception centers. This is the first order of business in civil defense for any metropolitan target area.

The second most important technical phase of civil defense in metropolitan target areas is probably study of the shelter potential in case of an alert without sufficient warning time for evacuation. Selections should be made of the most adequate shelter locations and use.

A third important area which requires the efforts of the professional engineer is the formulation of ways and means whereby utility plants and industrial processes can be shut down quickly or put on automatic control so that personnel may be evacuated and the damage to the utilities and industrial facilities minimized from lack of attendance by operators. This would be important for those facilities which were not destroyed under a bombing so that they could be put back into full-scale operation in the shortest possible time, and it is also of great importance in case the aircraft attacking the city, which caused the evacuation, were intercepted and shot down and the city spared an attack. In this latter case, re-entry into the city might be effected quickly and proper technical planning would have minimized damage to industrial facilities and processes through lack of attendance by operators.

Emergency communications and radiological monitoring are other important areas requiring technical support planning and guidance. These are examples of civil defense areas in which the professional engineer must play a vital role in our metropolitan areas.

In the smaller communities which are not likely to be direct bombing targets, the most important civil defense areas requiring the attention of professional engineers are in technical support for bombed metropolitan areas and radiological monitoring under the possibility of long-range, down-wind fall-out from a bomb exploded over a metropolitan target. Technical support by the smaller communities is essential to the over-all civil defense technical plan, since bombed metropolitan targets may be incapable of rendering adequate aid to their own area because of the broad scale destruction of facilities and equipment and the general magnitude of the problem. Smaller communities should be made to understand that their technical preparation for the aiding of the metropolitan areas is as essential to their own ultimate welfare and the continued existence of our nation as we now know it, as if the attack had been directly upon that community. Economically and socially, our small communities and metropolitan areas are inter-dependent in maintaining the American way of life.

Below at left, Administrator Peterson has hamburgers with Denver CD leaders.

Q. Just what is the function of the Federal Civil Defense Administration Engineering Services in coordinating engineering activities and responsibilities in the over-all defense picture? What help do they offer the state and local CD planners?

A. Public Law 920, 81st Congress, which established the FCDA, declares it to be the policy and intent of Congress that the responsibility for civil defense shall be vested primarily in the several States and their political subdivisions. The FCDA is charged with preparing national plans and programs for the several States and their political subdivisions, and providing the necessary coordination and guidance of their programs. In addition, of course, the Act grants to the FCDA emergency powers for application in the post-attack period, with which you are not primarily concerned in your consideration of this problem. Under these charges from the Congress, the FCDA Technical Advisory Services (which includes the Engineering Office) furnishes technical assistance to the States and political subdivisions in a number of ways, such as the dissemination of engineering data related to the civil defense problem by means of appropriate publications, by matching funds for technical equipment in the engineering, radiological, rescue and other fields, and by direct technical assistance on specific problems by technical personnel of the seven regional offices of FCDA and the national office. This technical assistance encompasses consultative advice on the effects of nuclear weapons; on protective construction for buildings, control centers and shelters; in the organization and equipping of engineering service teams for such functions as emergency pipe laying, emergency water purification, emergency electrical power supply, debris clearance and other fields; and inventories of engineering equipment and supplies for emergency post-attack use.

In addition, Technical Advisory Services sponsors contract research and atomic field testing designed to yield practical answers to many technical problems confronting states, cities, industries, and individuals under the threat of nuclear weapons attack. The FCDA stands ready at all times to assist the states and local governments in any technical phase of the civil defense problem, to the extent of its organizational capabilities.

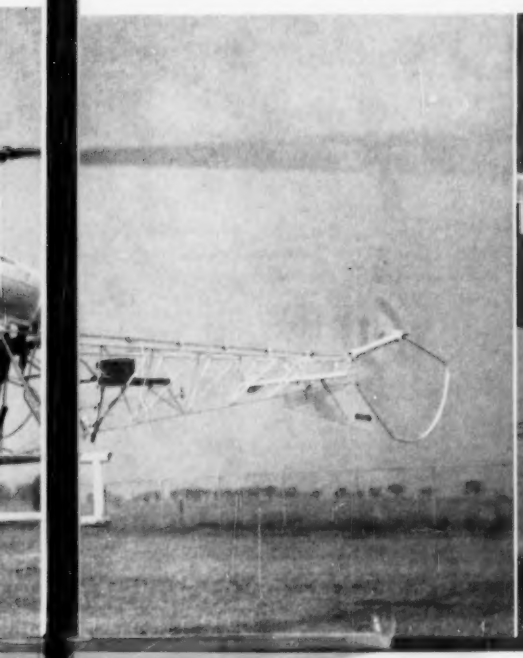
Q. In your opinion can there still be some sort of adequate shelter program in the larger cities? Or do you feel that evacuation of these cities is the only answer in the event of hydrogen warfare? Given sufficient warning, can evacuation really be accomplished effectively and without complete panic and chaos?

A. With regard to the subject of evacuation versus shelter, there is definitely a place for both methods of protection. In the first place, evacuation is dependent upon adequate warning time of impending attack. Improved detection methods and equipment should continually lengthen this probable period of time, with consequent improvement in the effectiveness of evacuation, but there can never be a guarantee of adequate warning time for any specific city since it is always possible that one or more aircraft may slip through the warning net or that a nuclear weapon could be delivered to its target by a submarine-launched guided missile, or smuggled into the country. Further, there is the future potential problem of attack by supersonic intercontinental guided missiles armed with nuclear warheads, which could result in the necessity for a broad program of heavy shelter construction in our target areas at enormous cost. For the near future, however, evacuation appears to offer the most effective means of saving the greatest number of lives.

In instances where early warning is not received and the first warning indicates that attack is imminent, it would be necessary for the population of the metropolitan area to seek the best shelter available in an effort to save the maximum number of lives. This is a contingency with which we hope we will not be faced. Planning the evacuation of a city, educating the public to accept this doctrine for their own welfare, and training the public in carrying out the evacuation plan is a major undertaking, but an essential one for every target area. Quite a number of cities have made considerable progress in planning for evacuation and in actually conducting evacuation exercises. In addition, theoretical studies have been made of the evacuation capabilities of certain cities. The results of these exercises and studies give definite indication that,

(Please turn the page)

Below, center, the CD head flys a helicopter and, right, at Mayors' Conference with Ike.



with sufficient warning, evacuation can be accomplished effectively and without panic and chaos.

If the public is properly trained in the evacuation plan, and participation in exercises made mandatory for their own welfare, it is entirely possible that an evacuation under a real threat may be carried out without definite knowledge on the part of the public that attacking aircraft are really on the way. In this case, there should be little possibility of panic or chaos. The real test of the public education and training in evacuation would come were the evacuation carried out with the knowledge that one or more cities in the country had already been struck by enemy bombers. The consensus of experts seems to be that there is much less likelihood of panic developing in the open during an evacuation than there is in the case of smaller groups in confined places. Of course, the success of the whole plan depends upon intensive public education and actual training by participation.

Q. Do you think that the smaller, relatively safer communities are giving enough consideration to the possibility that they may well become "refugee centers" in the event of evacuation and/or destruction of our large cities? What preparation ought they to make with this consideration in mind? And can you cite any examples of smaller communities with adequate plans already developed for such a contingency?

A. Though the smaller, relatively safer communities were considered important in earlier civil defense planning, their interest and participation were naturally much slower than that of target areas. With the advent of thermonuclear weapons it is no longer possible to plan on the physical resources of critical target cities. Thus, where formerly the smaller and relatively safer communities could choose the amount and degree of civil defense preparation they felt it necessary to have, it now becomes imperative that all communities, whatever their size or location, become a part of the planning which is so essential to the recovery of the nation in the event of an attack.

Civil Defense thus becomes an area problem, and planning must transcend political jurisdictions. Though the initiative for this planning is likely to be taken by the target area itself, this is not always the case. Moreover, the policy of evacuating civilians from dangerous areas increases the number of human beings who will require some form of temporary or extended care.

A number of test exercises have been carried out or are being planned, to test among other things, the capacity of the smaller communities and the so-called support areas to absorb and care for the homeless and temporarily dishoused persons who may require these services after an attack. The establishment of reception areas, emergency mass feeding installations, temporary lodging from weather extremes, centers for registration, information and for the reuniting of families, and specialized assistance to people in need are some of the services which must be studied. Notable work in support planning has been done in New York State and in California.

Certain national organizations, associations, and industrial and military groups have lent support to planning which has been initiated in this respect. The rural areas in some states, spearheaded by farm organizations, women's groups and the like, have begun to develop plans whereby they can determine their capability in handling the problem of evacuees who will require care in the event of a serious disaster. Weld County, Colorado, is such an example as is New Market, Maryland. These communities have given careful consideration to the problems which would confront them in the case of a large and widespread disaster. Their experience will be of great value to other communities where steps are under way in developing civil defense support planning.

Q. It is obvious that in many strategic areas there necessarily is a close tie between civil defense and industrial defense. Would you care to comment on whether enough is being done to correlate the defense efforts of civic and industrial defense leaders? What role can the engineer play in making the correlation more effective? In this same regard, do you think that sufficient attention is being given to defense considerations in the selection of sites for new industrial plants? In other words, do you feel that industrial dispersal is at least a partial answer to some CD problems? And do you think that adequate progress is being made in this connection?

A. The problems raised in your questions probably can best be handled simultaneously. The National Industrial Dispersion Policy has adequately expressed the position of the Federal Government insofar as industry is concerned. The mere formulation of a dispersion policy does

The Atomic Age marches on. This photograph was taken at the National Reactor Testing Station at Idaho Falls, Idaho. At the reactor control panel is Dr. Marvin M. Mann, who was an engineer at Oak Ridge National Laboratory and who assisted the control group in starting the reactor.

Photo by Phillips Petroleum Co.

not, however, overcome the very real problems of labor supply, availability of material, transportation, housing and marketing. Industrial dispersal, with attendant dispersion of population concentrations, will of course greatly simplify the civil defense problem. Integration of industrial planning facilities—self-protection, for example—with state and local civil defense planning will furnish earlier solutions to the evacuation or the shelter problems of civil defense.

Since engineers representing industry are ordinarily in a position to influence the policy of industrial management they should correlate their plans with the local civil defense representatives for mutual benefit. While we feel that dispersal is not proceeding as rapidly as we desire, we recognize the problems, as outlined above, and feel that continued emphasis will gradually result in adequate progress. In the interim, we feel that all emergency planning expedients should be investigated.

Q. Would you care to single out any particular city or area where you think civil defense preparedness is particularly exemplary?

A. As you know, I get around the country quite a bit, and I have found a gratifying number of communities—states, counties and cities—which are doing tremendous civil defense jobs. More and more they are taking hold of this evacuation problem and working out their own solutions to it. I could name a number of those places, but there are so many more communities which are also doing a fine job that we don't know much about, that I think it would be unfair to cite some at the expense of others equally prepared.

Q. If the unfortunate relaxation in the civil defense effort is overcome, how does the FCDA plan to sustain interest in the program so that no more dangerous lags take place? Can engineers, perhaps through their professional societies, assist in keeping the program effectively alive for an indefinitely prolonged period of so-called "cold war?"

A. The sustaining of interest in a civil defense program over an indefinitely prolonged period of so-called "cold war" is a definite problem, even after the initial lag is overcome and the organization, education and training of the public is completed. The approach to this problem must be a continued program of education to keep the public alerted to the danger of lagging effort, and a sustention of training programs and exercises to keep the problem before the public and provide an outlet for the exercise of their training. Other organizations, such as the National Guard, are kept in being with a reasonable degree of efficiency without actually exercising in reality, over long periods of time, the function for which they are trained, and it does not seem unreasonable that the same standard could be maintained in civil defense organizations provided they are properly staffed and trained, and given the opportunity to exhibit their skill in frequent exercises.

Q. Are there any further comments that you would like to make on the CD program in general and on the engineer's role in it?

A. The only other comments that I would like to make on the civil defense program in general, and the engineers' role in it, is that adequate and trained civil defense organizations may mean the difference between our surviving or perishing as a nation in the event of an all-out enemy attack; and that the engineer, because of his technical knowledge and his ability to comprehend the problems and effects of enemy attack, must consider himself a key man in formulating, selling, and carrying out civil defense plans, whether they cover evacuation, radiological monitoring, shelter construction, emergency bridging of rivers, or any of the other myriad of interests in which our engineers of today participate.—***End.***

About Mr. Peterson . . .

Val Peterson, former Governor of Nebraska, was sworn in as administrator of the Federal Civil Defense Administration by President Eisenhower on March 4, 1953. Prior to this time he had been serving as administrative assistant to the President. He is also a member of the Commission on Intergovernmental Relations.

A native of Oakland, Nebraska, Mr. Peterson is a graduate of Wayne State Teachers College and also of the University of Nebraska. From the latter he received a master's degree in Political Science.

Before his election as Governor, he was superintendent of schools in Elgin, Nebraska, and he taught at the University of Nebraska. He also published *The Elgin Review*, a weekly newspaper, from 1936 to 1946. In 1941-42 he was secretary to the then Governor of Nebraska, Dwight Griswold. During World War II, he served overseas in the Burma-India theatre of operations; and he is presently a colonel in the Air Force Reserve.

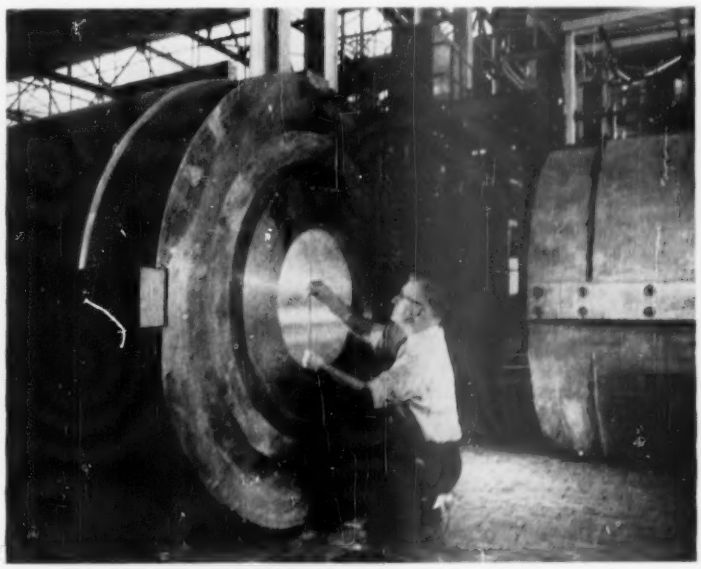


Photo by AEC-DOA

The author says that since engineers representing industry are in positions to influence the defense policies of industrial management, that they should correlate their plans with local civil defense representatives for mutual benefit.

American Engineer

20th YEAR OF PUBLICATION

1935 — 1955

Happy Birthday to Us!

Original Aims Hold As AE Becomes 20 Years Old

By KENNETH E. TROMBLEY,

Editor, The American Engineer

THINKING in the time dimension, twenty years is not at all a long period. But when one is dealing with the days and years during which an almost undefinable group of men build themselves into a vigorous and highly respected profession, it is a crowded and significant length of time indeed. And the AMERICAN ENGINEER, as the official publication of the National Society of Professional Engineers for twenty years as of this issue, has been the proud chronicle of these two historical decades.

It was in the January 1935 issue of the magazine that the announcement was made. Dr. D. B. Steinman, NSPE's first president and founder, was at the Society's helm. The late Arthur V. Sheridan, widely respected engineer and writer, was editor of the magazine. They wrote:

> With this issue, the AMERICAN ENGINEER takes its place as a national publication and achieves an objective envisioned at the time of its conception. Established, sponsored and owned by the New York State Society of Professional Engineers, the magazine, which has for three years served as the official bulletin of that body, and for two years in a similar capacity for the New Jersey Association of Engineers, now passes to the control of the National Society of which New York and New Jersey are charter members . . .

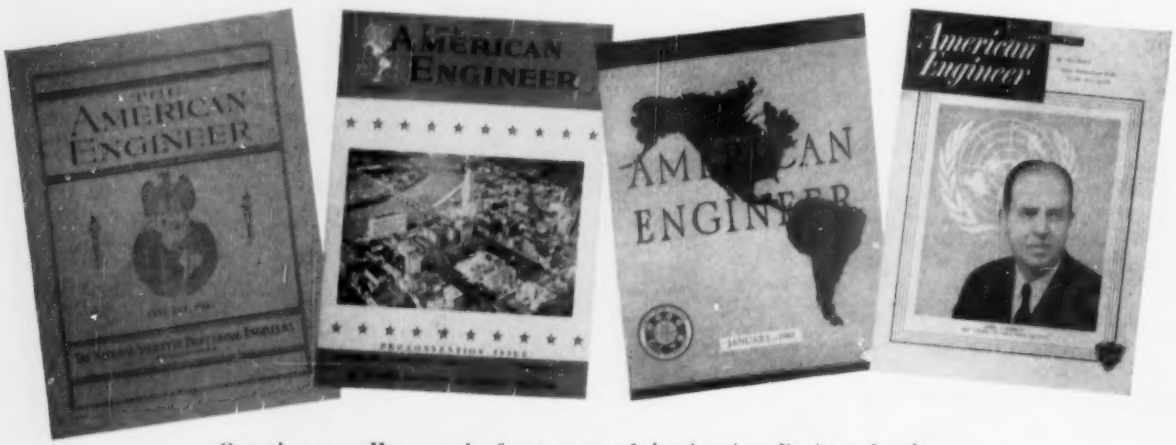
Then these wise early leaders made it clear that the original purpose for which the magazine was created should not be changed. They felt that the publication had been established to fill a definite need. They felt that "promoting the interests of the profession and the public in its relations therewith is not and never has been the primary, exclusive function of any periodical," and it should be assumed by the AMERICAN ENGINEER.

Now, it has been stated above that these founders were wise men, indeed, and no where is this more strongly affirmed than in another portion of their original statement. Apparently fully cognizant of the evils that beset any editor in the honest performance of his duties, they wrote further:

> In common with all who are not ominiscient, the editor must take some things for granted and some on the words of others. . . . Some things will escape editorial correction and the editor, who must earn his livelihood from the daily practice of his calling, can only hope that detection will meet with tolerance tempered by a recollection that "To err is human, to forgive Divine."

Bravo!

Now, the twenty years in question were not, when thought of in terms of the engineering profession's growth, so lacking in substance that they can be dealt with in detail here. It would appear more logical, therefore, to deal with the period in increments of, say, five years. Come along then on a trip through the pages of the AMERICAN



Over the years. Here are the front covers of the *American Engineer* for the January issues of 1935, 1940, 1945, and 1950, reading from left to right.

ENGINEER; those issues for January of the years 1935, 1940, 1945, and 1950.

IN January 1935 our time capsule would reveal a nation gripped in a monstrous industrial depression which, necessarily, was afflicting great hardships upon the profession as it then existed. Against this backdrop it can be said that the profession, along with the rest of the nation, was groping for better things. Articles in the magazine reflected this search. Pieces in those days argued mightily for registration laws for professional leaders could not foresee a true professional status without them. Articles pleaded for "professional consciousness" in almost pathetic terms. We "deserve a place in the sun" might be said to be the theme that repeatedly ran through the AMERICAN ENGINEER's written word twenty years ago.

By 1940 the AMERICAN ENGINEER and the profession had attained a certain mature stature; they were "more sure of themselves" and this attitude is apparent in the publications recording the events of the time. Monthly issues involved here show less stress on the early basic requirements such as registration laws, and more of the printed page is given over to the necessity of the individual engineer to grow and accept his responsibilities as a citizen as well as a technical man. The "Second Mile" it was termed and it meant giving more of one's self than a nine-to-five job demanded. It meant getting into politics, supporting engineering education, policing the profession, being a community leader. But it meant more than "doing." It meant "being." It meant being more rounded individuals, an awareness of "human relationships" if you like.

Many of the articles during this period seem overly harsh but possibly this reaction only points up the tremendous progress that since has been made. Many of the articles seem negative but, again, probably this was the medicine needed at the time. It was a matter of ridding individual engineers as well as the public of the "muddy boot" concept of engineering and applying the "clean collar" approach. In hindsight, it would appear that the magazine served a most useful function in directing light on the weaknesses of the profession and even, at times, applying the needle to get people a little angry.

NOW the war years. As is pointed out on these pages by Engineer Vincent Waters, presently chairman of the NSPE Publications Committee, these were trying times for the magazine as well as for just about everything else. Society activities came almost to a halt. Quite frankly, the Nation's engineers had their hands full trying to turn out tanks, and guns and airplanes, as well as serving in the armed forces around the world. The AMERICAN ENGINEER reflected this war tone and much space was devoted to straight news reporting of how the profession was serving its Nation. But, even so, the demanding necessity for professional growth continued and many pieces by leading educators and engineers attempted to appraise "what was wrong with engineers."

The January 1945 issue features an article celebrating the tenth anniversary of the Society and the magazine. A decade had passed. It had been a decade of depression and war, scarcely favorable days during which to gain the attention of worried and busy people and try to sell them on the value of "professional consciousness," which is as good an expression as any to sum up the golden goal. But it was done. And we like to think that the AMERICAN ENGINEER helped do it.

From 1945 until 1950, the Society experienced a period of intense internal organization. Members joined by the thousands and State Societies literally by the dozens were formed into new and eager groups. It was a period of shifts and changes and "growing up" and, again, the AMERICAN ENGINEER was the mirror. The magazine became almost more of a house organ than a professional engineering magazine, devoting most of its contents to the myriad changes that were being wrought within the Society itself. Had it ceased, then, to carry out the edicts of the founders? Possibly, yes, in a way, but who can say that it did not perform an even more important function for the over-all result by helping to forge a really great Society?

BY January 1950 there emerged something new from the printing presses. After much thought, sweeping changes were made in the magazine. It was the end of reconversion after the war. Out came a magazine devoted strongly to the over-all objectives of the Society and the profession. The editorial tone was affirmative, in keeping with the higher professional status enjoyed. Attention was focused on the great engineers now so active in every field from politics to industry to education.

Those of us working on the magazine believe that in journalism, as in about everything else, that there is no standing still. What fails to go forward inevitably goes backward. Now, whether this is good engineering logic or not, we frankly admit we do not know. But we do know this: it's exciting to try and make each issue a bit better than the last one. After all, what is more dull than a rut?—***End.***

An Anniversary Statement By
Vincent F. Waters, P.E.,

Chairman, NSPE Publications Committee

With the phenomenal growth of the National Society of Professional Engineers in the short span of 20 years, and the vital problems faced by the officers and directors during the World War II years and thereafter, it was probably only natural that these problems were given first consideration before delving into the complex operation of publishing a top-notch professional magazine. After several years study following World War II, the officers and directors took the steps necessary to place the official organ, the *American Engineer*, on a commercial-magazine basis with a qualified journalistic staff.

During the past few years, the *American Engineer* has developed to a high journalistic degree, and on the firm foundation on which it is operating, the future will see its continued growth in size and professional attainment.

The especial interest of the officers and directors, as well as the former and present members of the *Publications Committee*, has been very helpful to the Staff of the *American Engineer* and the chairman of the *Publications Committee*. The New Year of 1955 will bring with it new improvements in the *American Engineer*, making it more valuable and interesting to the 33,000 members of the National Society of Professional Engineers.

Vincent F. Waters, P. E.,
Chairman,
National Publications Committee

Most Engineers Are Inventors or Would Like to Be. Here's the Short Story of One Who Knows the . . .

Satisfaction of Invention

By

Richard F. Harvey,

Registered Professional Engineer

THE desire for progress and public service rather than financial gain is the motivating force behind the important engineering inventions which are the cornerstone of our civilization. Everything we use, everything we see, everything of material value is all based on countless thousands of inventions. Without invention there would be nothing of the civilized world as we know it, only vacuum, only barbaric, animal existence.

Thomas A. Edison, one of the world's most prolific inventors with over one thousand patents to his name, stated that the expenses of experimenting and fighting his claims in court cost him more than he received in royalties. While he did profit financially, it was as a manufacturer and not as an inventor.

Progress and public service mark the duty of the true professional engineer. It is an important part of the engineer's heritage to assure that the record of past accomplishments not only be continued but accelerated. A consideration of the inventor, his motives, his methods, and his difficulties will be helpful in preparing for and encouraging future progress. Invention is an important and often neglected field of engineering where sound engineering principles and professional standards should be applied. Progress to be effective should be carefully planned. It should not depend on accident as this is too uncertain, although chance sometimes plays a large part in invention. A classic example is the discovery of the vulcanization of rubber by Goodyear who dropped his experiment on the stove thus inadvertently proving the necessity for heat as well as for sulphur.

Twice in a little over a decade we have been engaged in world wars. If our technical superiority becomes lost or seriously diminished there is grave danger of an all-out atomic war which could completely destroy our civilization.

In this connection it is pertinent to note that according to a recent survey the Russians are training 43,000 new engineers yearly compared to 23,000 graduate engineers in the United States last year. If our technical advantage is to continue, we must train inventors and creative engineers in greater numbers and use their abilities to the fullest extent.

The government now spends about two billion dollars a year on research and development, most of it relating to defense. There is a popular idea among many that we can solve nearly any problem if enough money is spent on it. While this may be true to some extent, often it is not clear as to what problems must be solved. In fact many important inventions were not wanted or used for many years. Simon Lake, the inventor of the submarine, patented in 1905 an air supply apparatus for submarines now commonly known as the snorkel. No one wanted this invention for decades until the Germans developed it into a highly effective weapon of war during World War II.

Inventions mean progress. The RCA table model electron microscope shown above is designed for use in colleges, hospitals and industrial laboratories.

MOST of the important inventions were sparked by individual inventors often working with crude equipment and under severe handicaps. Yet they succeeded in fields where well-staffed teams of research workers failed. Mention is made of this, not with the thought of criticizing anyone, but with the thought of pointing out that crea-

tive ability is not overly abundant even among engineers and scientific men. Efforts to more fully utilize the inventor's abilities pay off in technological progress. Captain George N. Robillard, Patent Counsel for the Navy and Assistant Chief of Naval Research for Patents, emphasized the necessity for giving inventors a fair break if we are to survive.

The writer's own experience with an invention of recognized importance—the "Step-Quenching" or "Martempering" of steel—met with both success and adversity. This experience taught the need for a professional approach towards creative engineering work. One learns that often the greatest recompense derived from even a world-wide innovation, is a measure of personal satisfaction—a knowledge that one has contributed his bit to progress.

Many engineers and men of science are gifted with the creative spark to comprehend relationships which no one had known previously. This spark may be likened to potential energy which if properly nurtured may be transformed into kinetic energy to do useful work, or it may be dissipated and amount to nothing. Only those who approach the frontiers of science, with the pride of workmanship and the urge for public service and not with the desire of acquisitiveness, are likely to succeed. The pleasure resulting from experimentation, the satisfaction of solving problems, and the desire to create and contribute to progress, resulting from an inborn and irrepressible urge to invent, are the real motives which create inventions.

An invention undergoes a metamorphosis of five stages: preparation, incubation, conception, verification, and communication.

In the preparation stage, knowledge is accumulated. Pertinent information is obtained by study. In the intuitive period of incubation ideas are formed and one has the feeling that he is on the right track. Without conscious effort at the time and with a "click" the idea strikes. This is the shortest but probably the most important stage of invention. In the verification stage, one subjects his idea to the acid test of trial and check to determine whether it is really useful or just an interesting theory.

The fundamental discoveries and inventions of scientists and inventors must be communicated to others in terms that are readily understandable in order that this information may be accepted by industry and technology. This is much more of a problem than is generally realized and today we see evidence of a serious breakdown in communications not only between men of science and the public, but also between technical men themselves.

The sciences have become so complex and specialized that technical men in closely related fields have difficulty understanding each other. Many engineers can't explain their ideas to management or to the public. This breakdown in communications and lack of understanding stifles invention and retards progress.

Not only does the inventor and creative engineer have a moral obligation to present his results in clear, readily understandable terms, but also it is greatly to his advantage to do so. The inventor should not expect management, the public, the patent office, his technical colleagues, or anyone else to accept ideas they cannot understand.

An invention, although technically complete and important in high degree, is deficient until it has been described and made available to others in clear, understandable terms. Many worthwhile developments have failed completely because this factor was not given the consideration it deserves.

Qualities which are desirable to a successful inventor include: the desire to serve, integrity, scientific curiosity, creative urge, imagination, and ingenuity. In addition he should have a stubborn persistence and intense devotion to his invention after its validity is established.

One obstacle which hinders many otherwise well qualified engineers is the emphasis of their education and training on accuracy. They are taught that mistakes are intolerable. The inventor on the other hand is a dreamer who is wrong most of the time. If he fails hundreds of times but finally comes through with a good idea he is considered successful. For example, in developing the incandescent electric light, Edison tested over 3,000 different materials for filaments. While his batting average was quite low in this endeavor, the electric light ranks with the greatest of all inventions. It is not intended to imply that accuracy is undesirable, but invention and creative engineering involves a different approach and it is difficult for many engineers to reconcile this factor to their attitude of mind when confronted with that type of engineering problem.

ENGINEERS should be proud of the accomplishments of their profession. They hold the key to the future and it is their obligation to assure that the progress of the past is not only continued but accelerated.

The physician traces back to Aesculaius, the Roman God of medicine, and the lawyer goes back to Solon, the Athenian lawgiver of the 7th century B.C. The engineer can trace back further. However, no one knows with certainty the names of early mechanical engineers who made such fundamentally basic inventions as the wheel or the pulley, or of the early metallurgical engineers who transformed the stone age into one of brass and later to steel.

We are entering an age of increased engineering activity which will climax man's effort to shift labor from muscles to machines, to make material abundance available to all, and to extend our civilization into the remote areas of the world. Engineers have the ability and capacity to advance our knowledge beyond calculation. The developments of the future, like those of the past, will be made by engineers driven with a common ideal which places service above gain, loyalty above individual advantage, and personal satisfaction above pecuniary motives.—***End.***

About the Author . . .

Richard F. Harvey of Rehoboth, Mass., who discusses the problems and satisfactions of being an inventor for the AMERICAN ENGINEER, is an authority on isothermal heat treatment and is well-known for his work in developing the "Step Quenching" (or "Martempering") process for the hardening of steel.

Mr. Harvey

A graduate of the Worcester Polytechnic Institute with both B.S. (Chem.) and M.E. degrees, Mr. Harvey is currently chief metallurgist for the Brown & Sharpe Mfg. Co. in Providence, R. I. He is a registered P.E. in Massachusetts, past chairman of the Rhode Island Chapter of the American Society for Metals, and a member of the American Society for Testing Materials and other technical and engineering groups.

Corporate Professional Practice vs. Individual Professional Practice

By

The Special Committee on Registration Law*
New York State Society of Professional Engineers

MUCH searching thought has been given recently by engineers in New York State to the State registration law which prohibits the practice of professional engineering by corporations. They have been seeking answers to important questions illustrated by the following: Is it right for persons who are not engineers to be involved in the practice? Is it right for persons who are not engineers to form corporations to practice? Is the philosophy of registration amenable to corporate practice?

The problem is universal and will affect all engineers in the United States. The New York State Society of Professioanl Engineers (NYSSPE) has bent its efforts for two years in resisting attempts to legalize corporate practice of engineering on terms which would jeopardize our standing as a profession. This struggle has been against an organization called the Committee on Engineering Laws (CEL), backed by a group of corporations whose sole objective appears to be the legalizing of corporate practice of engineering for corporate benefit. The bills they advocated in 1953 and 1954 show no concern over the effect on the public of making it possible for any person to practice professional engineering in a responsible position under the cloak of corporate anonymity. The stated program of CEL is to take pilot action in the State of New York, and then to follow through in all states and territories.

The problem will be considered for the third time by the New York State Legislature during the next several months. Engineers in New York State, in the hope of avoiding another dispute before the Legislature, have engaged in a strenuous effort to resolve the issues in time for the meeting of the Legislature during the first quarter of the year of 1955.

Actions taken during the last two legislative sessions have been precipitate and unilateral. The struggle before the State Legislature is costly and should be avoided. When the professional engineers and corporation representatives come before the legislators in disagreement, the legislators are inclined to delay action. And so the dispute goes on without settlement. With mutual respect and honorable conduct, it should be possible to resolve the matter outside legislative halls.

*Special Committee on Registration Law: H. F. Roemmele, Chairman; L. J. Sforzini, V. G. Terenzio, Ex Officio; T. M. Linville, President, NYSSPE; H. H. Funk, Executive Secretary, NYSSPE; F. D. Wells, Counsel. The members of the Committee have held more than a hundred conferences, countless discussions, and have studied hundreds of communications.

Nature of the Problem

The problem concerns the philosophy of the practice of professional engineering. Engineers rightly value their prerogatives, which they hold in common with other learned professions. In 1935, New York State engineers successfully sponsored legislation to restrain corporate practice, excepting only engineering corporations then engaged in such practice. The dentists did the same thing earlier. The laws for licensing medical doctors, lawyers, public accountants, and architects all forbade corporate practice. These actions came about because it is believed that professional practice, in the public interest, is the function and the responsibility of the individual practitioner whose education, experience, character, reputation, and competence can be examined and publicly certified.

Now, some corporations formed since 1935 outside New York State want to come into the State to practice. Some other corporations in the State want to merge their engineering components engaged in public practice into their corporate structures. Still other corporations formed prior to 1935 and, therefore, practicing lawfully want to practice in other states where existing laws now forbid them. They hope to change the laws in these states after the precedent has been established in New York State.

Many Groups Are Interested

The opposing points of view are those of the profession and of business. At the heart of the matter is the question—Is engineering a business or a profession? The viewpoint of the corporations, the CEL, is a business viewpoint and the arguments are business arguments. The viewpoint of the engineers is a professional viewpoint and theirs is a professional argument. Many partners in consulting firms, as well as industrial and engineering leaders, support the professional viewpoint.

The professions of medicine, dentistry, law, accounting, and architecture are actively concerned in the outcome of this conflict in New York State. These professions have a similar problem themselves because in medicine there are a few clinics and group practices interested in incorporation. In law, accounting, and architecture there are partnerships and firms which are interested in incorporation. Thus, each one of the major professional societies has had occasion to study the problem of corporate practice and each has taken a firm position against it.

The articles of the State Education Law, covering each profession, have a great deal in common and are closely related. All prohibit corporate practice. The engineers feel bound to the other professions and feel obligated to stand with them. On the other hand, they recognize that there are distinct problems applicable to each profession, and that in each case *reason must prevail*.

The profession of architecture is more closely related to engineering than any of the other professions. The practice of architecture is deeply concerned with construction work. Since construction work is at the heart of the basic problem, the architects have a special interest. For similar reasons, the Building Trades Employers' Association takes a special interest in our problem.

The Regents, Commissioners, and Examining Board members are concerned. The registration laws are administered by the Regents of the University of the State of New York through the Education Department at Albany. The Commissioner of Education, the Associate Commissioner for Higher Education, the Assistant Commissioner for Professional Education, and the Counsel for the Department have responsibilities or interests that are involved. The members of the State Board of Engineering Examiners are vitally interested and concerned.

THE Senate and Assembly of the State Legislature are the decisive final bodies who will act after all the opinions and arguments are presented.

Many Corporations on Sidelines

Many corporations are on the sidelines because they are lawfully operating under the present law. This is particularly true of those engaged in manufacturing and in operating utilities. They are the users of engineering services, not the purveyors. Their functions are to manufacture and sell *products* and not *engineering services* as such.

The engineers of these corporations are professional employees and the corporation itself is their "client." Recognition of them as professional employees encourages their organization on a professional, profession-wide basis as an alternative to collective bargaining on a labor union basis.

Model Law

The starting point or foundation of the engineering profession is licensing and registration. Registration laws have been enacted by every state, every territory, and the District of Columbia. The New York law is patterned on the "Model Law," developed and officially approved by A.I.E.E., A.S.M.E., A.S.C.E., A.S.E.E., N.S.P.E., N.C.S.B.E.E., and other major engineering societies.

The "Model Law" requires persons who offer to or do engage in the public practice of professional engineering to submit evidence of qualifications and to register. Those persons not engaged in public practice who are serving as corporation or civil service employees who want public identification as engineers may avail themselves of registration. A license and a certificate of registration is legal recognition, i.e., public recognition, of a person as a professional engineer.

Primary evidences of professional status of an engineer are an engineering degree from an accredited college, adequate experience, and a reputation for good character and good practice. But the registration procedure has been set up in the states so that these and other evidences could be officially recognized and certified so as not to need continual re-examination. Hence, the publicly recognized "badge of membership" in the profession is the lawful certificate of registration. Some 185,000 engineers are lawfully registered, roughly 100,000 are in the pre-registration or engineer-in-training classification, and another 150,000 or more are employed as engineers without registration. Engineers appear to be progressing rapidly toward the time when practically all will be registered.

The "Model Law" says the practice of professional engineering is "any professional service or creative work requiring engineering education, training, and experience and the application of a special knowledge of the mathematical, physical, and engineering sciences to such professional services or creative work as consultation, investigation, evaluation, planning, design, and supervision of construction for the purpose of assuring compliance with specifications and design, in connection with any public or private utilities, structures, buildings, machines, equipment, processes, works, or projects." This is a broad definition which has received profession-wide and nation-wide public acceptance and approval. So has the entire "Model Law" and the underlying philosophy of registration. Thus, the starting point, or foundation, for the engineers' view of corporate practice is well established.

Engineers' View

We are now concerned with the question: Is corporate practice compatible with the philosophy (purpose and principles) of the "Model Law?"

Should persons who are not engineers, persons who cannot qualify for a license and cannot register, be permitted to incorporate with a charter allowing the practice of professional engineering and thereby obtain the privilege denied to them as individuals?

The "Model Law" is of no help here for it says not a word about corporate practice. This does not prove it was deliberately not intended to give corporations the privilege although it may be presumptive evidence. In any event the laws of the states differ all the way from no mention of corporate registration and practice to specific prohibition of it. The principle of the "Model Law" would require a corporation to submit evidence of qualification and to register. After exhaustive committee studies and conferences with all interested parties, the Board of Directors of the New York State Society of Professional Engineers reached the following conclusion: It is in the public interest that persons who are not engineers should not incorporate to practice engineering through hiring of one or more lawfully registered engineering employees. If they could, it would largely weaken the registration law, facilitate its circumvention, and dilute its effectiveness.

THE philosophy of registration is that the practice of engineering is the function and the responsibility of the individual engineer. Contrariwise, the legal basis and purpose of the corporation is to substitute limited corporate responsibility for individual responsibility. Because a corporation carries sole legal responsibility for its actions, an individual engineer is not the decisive factor, and therefore is not the responsible factor. This strikes at the roots of the professional concept.

Philosophy

A definition from Webster defines a corporation as "any body consisting of one or more individuals, treated by the law as a unit; esp., such a body consisting of persons and endowed by law with the right to perpetual succession and to act as a single person; the rights and liabilities of a corporation are distinct from those of the individuals composing it." Consider this definition in relation to the concept of a profession.

A profession is a calling in which a person uses special knowledge to render a public service. Special education and knowledge are the distinguishing factors of a profession. Evidences of professional status are one's education, training, integrity, and practice. When one publicly offers to practice, the public requires these evidences to be submitted by the individual to be licensed and registered. Can a corporation possess professional status? Can it submit such evidences and be registered? Could a corporation be lawfully qualified and registered provided all the persons in it at all times were individually licensed and registered?

This last question needs to be tested by critical analysis. For example, the licensing of individuals includes the right of revocation. What would it mean to revoke corporate registration if the same individuals could reincorporate? According to law, "the rights and liabilities of a corporation are distinct from those of the individuals composing it"; the corporation is "endowed by law with the right to act as a single person." Many professions have wrestled with this problem and have concluded that it is impossible for a corporation to engage in the public practice of any profession.

Nevertheless, the engineers of New York State have explored the possibility of making the corporation the tool of the engineers. They propose that individuals who have each submitted satisfactory evidence of qualification to practice professional engineering and have been lawfully registered, may join together to form a corporation. If the members of the board of directors, the chief executive officer, and all persons doing engineering work are licensed and registered engineers, the corporation might be qualified for registration (but not for licensing). The engineering management could employ legal, financial, and personnel experts, including professional lawyers, accountants, and doctors, but the corporation would have to be continuously organized in such a way that it could never be taken over by persons who were not lawfully licensed and registered engineers.

Providing for such a corporation is not considered to be a departure from the principle underlying the registration law; namely, that the practice of professional engineering is the function and responsibility of the individual engineer. There is no departure from the principle because the function of this type of corporation is to furnish the services of the individual engineer. The direction and management of the corporation itself would be by engineers. At the same time, this concept does not conflict with the legal reality that the corporation is an entity acting as a single person. Competent lawyers say that the individual engineer employed by such a corporation could be held professionally responsible and that the use of his professional signature and seal on his work would be recognized the same as if he were an individual practitioner or a partner in a partnership. Unethical, dishonest persons could be barred, or isolated and removed, from the professional ranks. Under double registration proposed above (of the corporation as a legal single person and also of the individuals composing it) either the corporation or the individuals or both could be held responsible for violations of professional work and conduct.

IN considering the proposed type of corporation, consultations were held with partners in engineering, law, and management firms, and it was found they generally did not want to incorporate. They said that theirs were service organizations doing work that required knowledge rather than labor, materials, and money. They have no large assembly of labor and materials. They do not have large fixed assets or inventories. Their compensation is by the job. There are no substantial capital gains or other tax benefits that can be obtained. Capitalization as corporations would be small, and, therefore, stock ownership would not be substantial. The accumulation of cash from surplus for the purpose of capital gains or

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delayed compensation benefits would not be acceptable. Capital gains could not be realized without selling out. Their personal tax position as partners is preferred to that as salaried corporate employees, where corporate taxes would be levied as well as personal taxes. Finally, they said, whenever the capital requirements are large because of facilities, machines, and inventories as required for a business, they are determined that the professional work must be done separately because persons who are not engineers might otherwise become involved in professional responsibilities.

Several thoughtful industrial executives who were consulted said they can think of no better way to force engineering employees into labor unions than to make a business out of engineering under the command of persons who are not engineers. They are certain that professional status for the engineering employes requires: (1) the employee must act as a professional man; (2) his profession must have public, statutory recognition; (3) the employee must have met the public's requirements for identification as a member of the profession; (4) the employer must act as a client and must not engage in the practice himself unless all principal persons in the organization are engineers.

The ability of a financially strong corporation to make restitution in money for damages was generally said to be of less value than the protection given to the public by the registration law. Damages are collectible in cases of proven negligence. Negligence resulting in injuries is found in cases caused by failure or accident connected with the construction or operation of a structure, plant, utility, or product. The builder or operator bears the brunt of the liability. Seldom are damages levied against the sources of professional services. This is why protection against fraudulent and incompetent professional services is important. The best and most effective protection against injuries resulting from professional services is the registration law, which is effective both *before* and *after* the services are rendered, to prevent fraud and to restrain incompetent, unethical, or dishonest persons from practice.

Engineers Plan to Act

Professional engineers believe that engineering is a true public profession. They cannot accept any concept which considers it less than that. Moreover, the view is held that the present law was enacted in New York State with the advice and recommendations of men recognized and honored by industry, engineering, and the public including Dr. Arthur V. Sheridan, Dr. David B. Steinman, Dr. John C. Riedel, and others. Under the law, engineering and commerce have advanced here beyond anywhere else in the world. This advance has been accomplished lawfully with relatively minor exceptions. Therefore, it is natural that many engineers are asking why the law should be changed at all, and are reluctant to consider any change.

THE legislative conflict of the last two years indicates, however, that the provisions relating to corporations need to be amended to allow competent engineering staffs of corporations to render services to outsiders without involving persons who are not engineers in these services. Furthermore, matters concerning shop drawings and supervision of construction work need coverage similar to the coverage in the registration law for architects; and the Regents need authority to establish definitions of ethical practice. To take care of these vital points as well as with the hope of settling amicably the corporate practice issue, the engineers are preparing a proposed amendment to the present act.

As a vehicle for the growth and development of engineering practice for the future, particularly involving enterprises on a very large scale, a form of corporation is proposed, all the policies of which would be controlled by engineers; such corporations should enable engineers to serve the public without involving other people in their professional service. Most of the interested parties in New York State appear to agree that this is right. There is hope that all will agree.

The NYSSPE proposal is in sharp contrast with the CEL proposals. Had the bills proposed by CEL in 1953 and 1954 been enacted into law, the hundreds of applicants for engineering licenses who are refused each year by the Regents would have been given the opportunity to incorporate and practice professional engineering, at the innocent expense of the public and to the detriment of the profession. The proposed amendment to the law is designed to prevent this alarming prospect.

The Business Corporation

It is recognized that business corporations are valuable and essential for the execution of engineering plans. In fact, engineers are extremely proud of the accomplishments of industrial enterprise. They recognize their work as being in a large measure responsible for it. They themselves play a basic part in it.

Industrial corporations require the services of professional men—engineers, lawyers, accountants, doctors, as well as of financiers and business executives. It is only common sense that lawfully licensed, registered engineers should render service to such corporations as employees. Observation of responsible industrial organizations and consultation with enlightened industrial executives indicates that they do not and would not place engineering work under the management of persons who are not engineers. The chief engineer, the manager of engineering, or the vice-president for engineering is customarily an engineer. The general executives place themselves in the position of client in relation to their engineering people. They do the same with relation to their other professional employees, their lawyers, doctors, accountants, architects, etc. The general executives are not themselves practicing engineering or any of the other professions because their companies are not practicing for other companies. The engineers believe that this is in the public interest, i.e., that persons who are not engineers should not practice nor direct the practice of professional engineering. Such persons and their companies should obtain engineering services from qualified employees.

The Engineers' Objectives

Professional engineers must work closely with builders to gain practical experience and to do research and development. Engineers are more aware than anyone else that things must be tried out to be truly understood. There is no substitute for practical experience. An engineer must build things as well as conceive them. So manufacturing, construction, and operation cannot be separated from the practice of professional engineering.

But only two alternative organization plans are believed right: first, when the engineers are an integral part of the organization whose purpose and function is to build, manufacture, or operate; second, when the engineers are organized for the purpose and function of providing services to the public. In the latter case their practical experience comes through working closely with clients. They often do research and experimental or development work in association with clients as well as on their own.

THE engineers in New York State have not been able to find a way to combine business and industrial services in an incorporated organization which also provides professional services for the public. They believe it is not possible to make this consolidation and at the same time maintain the basic registration law. Most assuredly they believe persons who are not engineers should not be allowed to incorporate to practice engineering. They believe that corporations formed exclusively and continuously of engineers are a practical, as well as a basically not improper, means for making the services of large integrated groups of engineers broadly available.

Having come to this conclusion, the engineers hasten to say that their minds are still open and they are earnestly interested in any alternatives. They are hopeful of arriving at a common understanding of what is right with all interested parties, confident that what is right and in the public interest will be right for industry and for the engineering profession.

The Present Engineering Law

The present statutory provisions regarding the practice of Professional engineering are set forth as in Sections 7201 to 7214, inclusive, of Article 145 of the Education Law of New York State. These provisions in brief outline are as follows:

Sec. 7201 Professional engineering is any professional service such as consultation, investigation, evaluation, planning, design, or responsible supervision of construction or operation, in connection with any public or private utilities, structures, buildings, machines, equipment, processes, works, or projects, wherein the safeguarding of life, health, or property is involved, when such service requires the application of engineering principles and data.

Sec. 7202 Any person practicing or offering to practice shall be licensed.

Sec. 7203 Professional engineering services for public (government) work shall be done by licensed engineers.

Sec. 7204 A Board of Examiners shall examine applicants for license.

Sec. 7205 Applicants for a license must submit evidence of qualification and pass an examination.

Sec. 7206 Licensed engineers must register. Engineering corporations, lawfully practicing prior to and continuously since 1935, must register.

Sec. 7207 A license and registration certificate shall be presumptive evidence of compliance with legal requirements.

Sec. 7208 Exemptions:

1. Undomiciled persons legally qualified in their home states or counties may offer to practice.
2. Such persons may practice not more than 30 days per year.
3. Such persons may practice if they have

(*Continued on page 30*)

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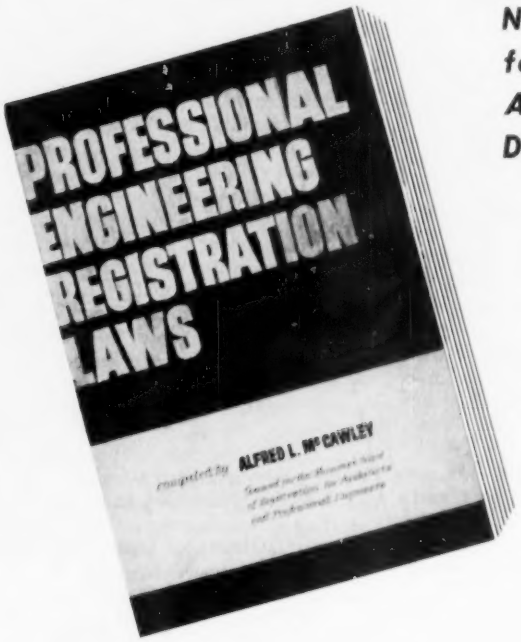

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The Author

Alfred L. McCawley, a Missouri State Senator for many years, is the author of numerous published articles on professional registration for engineers and architects. A sponsor of the Missouri securities law, he is counsel for that State's Board of Registration for Architects and Professional Engineers. His legal career dates back to 1900, when he was admitted to the Missouri Bar.

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Radio Tapes, TV Slides Ready For National Engineers' Week

Advance work for National Engineers' Week activities shifted into high gear this month as the NSPE headquarters staff in Washington filled a mounting pile of orders for a variety of promotional aids.

High up on the "popularity list" for these aids this year are the two brand new tape recorded radio programs and the TV slide showing the 1955 poster design.

The two 15-minute radio programs, priced individually at $6, are available at a cost of $10 for both. They have been prepared under the supervision of radio broadcasting personnel and are suitable for free public service radio time.

One of the programs, "The USS Nautilus—An Atomic Age Engineering Triumph," is a dramatized story of the engineering efforts that went into the building of the first atomic powered submarine. It features a tribute to the engineering profession by Rear Admiral H. G. Rickover, brilliant Naval engineer who guided the atomic sub from a drawing board idea to an ocean-going reality.

The program points up the cooperation on a professional level of engineers from industry, the Naval forces, and the atomic energy installations. It dramatizes Admiral Rickover's statement that the atomic sub was "90 per cent engineering and 10 per cent physics."

The second program, "Medicine, The Law, Engineering," is a discussion panel with Dr. Walter B. Martin, president of the American Medical Association; Mr. Loyd Wright, president of the American Bar Association; and Mr. Clarence T. Shoch, president of NSPE.

These professional leaders discuss the contributions of engineering to our modern way of life. The program emphasizes the way in which engineers work with the medical and legal professions.

Narrated by network announcers, the tape recordings this year were written and produced on the basis of suggestions and criticisms made of similar programs in the past. They were designed to give the chapters something which would present the engineering story in a way that would be welcomed by radio station as first class public service programs.

An entirely new promotional aid this year is the TV slide. This is offered at a cost of $1 and includes a 20-second spot announcement for TV station breaks.

The slides, made of glass and enclosed in metal frames, can be used on TV throughout the week as public service announcements. They may be used in all TV projection equipment and are made up according to recommended TV broadcasting standards.

Anatole R. Gruehr, national chairman for the Week, declared that the two tape recordings and the TV slides are "must items" for every NSPE affiliate. "These promotional aids are things that will bring the impact of National Engineers' Week before a wide audience," Mr. Gruehr stated.

Chairman Gruehr also reported that advance newspaper publicity points to a greater response to National Engineers' Week than ever before. Editorials have been noted from papers in all parts of the country commenting on the importance of professional engineers to the national economy. One nationally circulated magazine has announced a full length article on engineering for its February edition.

A heavy demand continues for other promotional aids offered by the National Society. These aids include large size posters, printed paper banners, seals, logotypes, and two newspaper articles on engineering set up on "mats." Multiple orders for these two articles indicates a wide acceptance by local newspapers.

Ohio SPE Proposes Registration Law Changes

Among the major proposed changes in the state registration law, recently endorsed by the Ohio SPE Board of Trustees, is a provision for waiver of the renewal fee when the "professional engineers' fund" has an unencumbered balance at the end of any fiscal biennium in excess of $75,000.

Another change would set the renewal fees at $3.00 for engineers or surveyors, or $4.00 for both, with no partial assessment. A penalty for failure to renew would be 10% per month or maximums of $6.00 and $8.00.

It is proposed that the registration board be permitted to hire an investigator.

Building Fund Certificates Are Still Available

Several inquiries which have been directed to the Headquarters office have indicated that an unfortunate misunderstanding may exist in respect to the issue of the Participation Certificates. President Shoch in a recent letter to members who indicated an interest in purchasing these Certificates stated: "Some of our members may have gained the impression from reading the prospectus that their desire to purchase more than one certificate would not be possible of accomplishment. If so, we are sorry indeed, for it now appears that we are able to honor subscriptions for additional certificates."

It is also apparent that a number of those who indicated a desire to purchase these certificates have delayed sending in subscriptions. It is hoped that the total amount of the subscription will be underwritten as quickly as possible, for additional expense both in filing and legal fees is incurred by the Society the longer the offering is held open.

President Shoch also emphasized that the December 31st date mentioned in the prospectus was established only to assure as wide participation as possible among the members. No attempt will be made after that date to apportion certificates. Subscriptions will be honored to the full amount requested on a first come-first served basis after January 1.

President Shoch went on to state: "In the event you have not sent in your subscription as yet, may I urge that you do so promptly in order that the Society may incur no more obligation than necessary and that the planning and construction of the building can go forward without delay."

Those who have already sent in a subscription for less than the amount they originally hoped to be able to purchase, should not hesitate to order additional certificates. A note or postcard addressed to the National Society will bring another subscription blank to those who have misplaced theirs or who would like to make a purchase beyond that which has already been placed.

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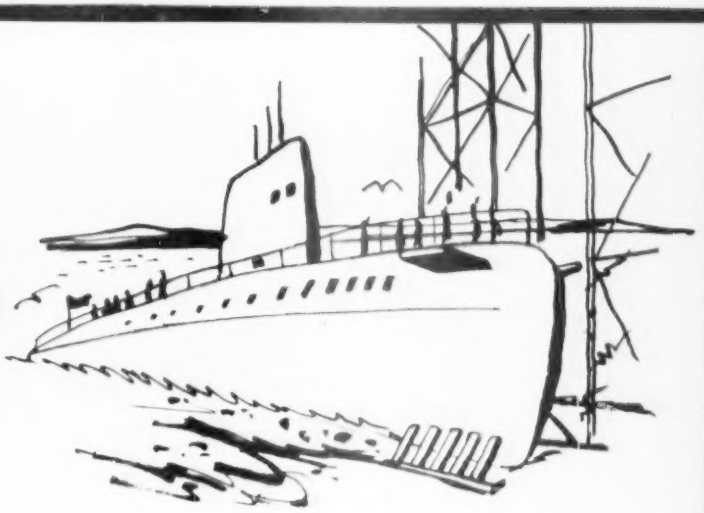

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Poster Television Slide

This is an expertly prepared glass slide showing the 1955 National Engineers' Week poster design. Included is a 20-second public service spot announcement suitable for local station and network use. These slides can be used throughout the Week during TV station breaks. They are made to fit standard TV projection equipment and are encased in metal frames. Every NSPE affiliate can get Television coverage with these slides. Order one for each TV station in your area.

Price, $1 each.

Busy chapter officers shouldn't overlook the varied selection of other promotional aids for National Engineers' Week available from NSPE headquarters. These include two feature articles on newspaper "mats"; large and small size posters; printed paper banners; Engineers' Week seals; and metal logotypes for use in printed matter. Be sure and place your orders as soon as possible. Orders are being filled by the headquarters staff as they are received. Avoid that last minute rush. Use the coupon below NOW.

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- ☐ 4. Poster TV Slide @ $1 ea.
- ☐ 5. Newspaper mat (On USS Nautilus) @ 50c ea.
- ☐ 6. Newspaper mat (On Engineering) @ 50c ea.
- ☐ 7. Posters (regular size) @ $4 per 100
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Court Holds Consulting Services Not Under Wage-Hour Law

The performance of professional services by a consulting engineer does not constitute activity within the coverage of the Fair Labor Standards (Wage-Hour) Act. This is the ruling of a federal district court, affirming a previous decision along the same line in another federal jurisdiction.

The U. S. Department of Labor had filed an enforcement action in the U. S. District Court, Southern District of Iowa, Central Division, against Kenneth R. Brown of Des Moines, Iowa, a registered professional engineer in that state, as the owner of the Brown Engineering Company, asking that he be enjoined from violation of the Act. District Court Judge Riley found that Brown was engaged in providing normal professional engineering services. The Government contended that such services, such as preparing plans and specifications which are to be sent to places in other states, constituted the production of goods for commerce, and that the preparation of plans and specifications which call for goods which must be fabricated in other states, constituted the production of goods for interstate commerce.

After reviewing several cases upon which the government relied, and distinguishing those situations from the action against Brown, Judge Riley referred to the decision of the Federal District Court for Maryland in *McComb v. Turpin*, decided in 1949. (AMERICAN ENGINEER, March, 1949.) He found that the *Turpin Case* facts were strikingly similar to the case before him and adopted the reasoning of that previous decision which had denied the Government's claim for coverage.

In the previous case, Judge Chesnut had declared: "Certainly the word 'goods' could not be construed to include the typewritten or mechanical expression by which the advice is given. These plans, drawings and specifications are not themselves the subject of barter or sale, but only the written embodiment of professional advice, and incidental thereto. They are specifically prepared to meet the particular problem of a specific client and are not sold or offered for sale to the public generally. They are, of course, quite unlike stocks, bonds and commercial paper which are themselves instrumentalities of commerce.

* * * *

"... the work of the employees does not have this required close and immediate tie with the production of goods. Their work is highly local in character being all performed in an office building . . . far removed in space from the projects to which their work relates. It is even more remote in its casual relation to the production of goods. Goods intended for interstate commerce can only be produced either manually or mechanically. These employees in no way touch goods so to be produced. Their work relates only to the preparation of plans and specifications for a building or other construction work. The building or structure so planned for may or may not thereafter be built. If built, it may or may not be used for the production of goods for interstate commerce. If used for the production of such goods the buildings themselves are merely housing for manual and/or mechanical work by which the goods are produced. To the extent that machinery or other processes of manu-

(*Continued on page 40*)

Conference Plans

North Carolina and National Societies Schedule Important February Meeting

The members of the board of governors of the Professional Engineers of North Carolina and National Society officials met recently at the Hotel Charlotte in Charlotte, N. C., to chart plans for a February 18-19 meeting. These dates will mark the annual spring meeting of NSPE, which will be held in conjunction with a PENC conference, at the hotel.

It is estimated that more than 300 persons will take part in the meeting, and Earl C. Hubbard, president of the PENC, has announced that several outstanding speakers will be included in the program.

Tentative plans call for an NSPE executive committee meeting on Thursday, February 17, the day preceding the opening of the full conference. Both the state and national groups will hold executive meetings on Friday, the 18th. Seminar-type sessions will be held Friday afternoon and also on Saturday morning. The annual banquet of the PENC has been scheduled for Friday evening.

Taking part in the meeting at which preliminary plans were drafted, in addition to President Hubbard, were: Paul H. Robbins, NSPE executive director; Robert B. Rice, NSPE national director; and John Bolen, Mr. and Mrs. George Rawlins, W. P. Wells, A. G. Odell, Lon A. Coone, J. S. Hunter, B. O. Vannort, John W. Dandridge, David Tobin, Frank Wooten, Jr., James T. Meador, C. B. Scott, and Robert B. Scott

Making meeting plans are, from l. to r., NSPE Vice Pres. Frank Wooten, Jr.; NSPE Ex. Dir. Paul H. Robbins; John Bolen, President, South Piedmont Chapter, PENC and Chairman, Spring Meeting Arrangements Committee; and Robert B. Cochran, Jr.; Secretary, PENC.

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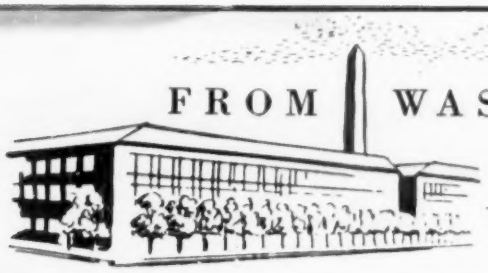

FROM WASHINGTON

By
Milton F. Lunch,
N.S.P.E.'s Legislative Analyst

THE NATIONAL RESERVE PLAN

The Administration has now unveiled its long-awaited plan to revamp the military manpower organization, particularly with respect to the draft, the reserve forces and the relationship to the supporting civilian economy. Taken in conjunction with other related developments, a basic pattern of administration thinking now emerges which will form the basis for extensive Congressional consideration and subsequent legislation in the 84th Congress.

The basic aim of the so-called National Reserve Plan is to train all fit young men for the armed services and provide a reserve of approximately 5,000,000 by 1959. Congress will be asked to enact the program for a four year period only, to be followed by later legislation incorporating revisions shown to be desirable by the earlier experience.

Under the plan the following main features are noted:

- A program for six months of military training annually for 100,000 youths who would then revert to a reserve status for nine and a half years.
- Continuation of the draft of men for two years of service, to be followed by reserve service for six years.
- Volunteers will continue to be accepted for normal three or four year terms, to be followed by a period of reserve service depending on the years of active duty.
- Those entering directly into a reserve unit, including the National Guard, would have to serve at least two years on active duty.
- In place of the present Ready Reserve and Standby Reserve new categories will be established. They will be:

Service Callable (Ready) Reserve—an organized and trained force constituting the reserve manpower base for the initial phases of a general mobilization.
Selectively Callable (Standby) Reserve—a non-organized, non-paid reserve pool which will provide experienced personnel for forces to be raised for the secondary phases of mobilization.

Application To Specialized Personnel

The Administration plan envisages a process for screening and selective recall to duty to assure a proper division of critical skills between the military forces and supporting civilian activities. Those in the Selectively Callable Reserve will be composed largely of personnel who have fulfilled their Service Callable Reserve obligation, or who have been transferred to the Selective group as a result of the screening process. The availability of such persons for recall will be determined by the Selective Service System based on allocation of critical skills between military service and essential civilian activities. This latter point represents a substantial departure from past military thinking that all persons in a reserve force are part of the military establishment and subject to the jurisdiction of the military.

This feature of the plan is a general acceptance of the Appley Committee report, (AMERICAN ENGINEER, March, 1954) but in its present state the administration plan leaves unanswered many questions, such as: what machinery and what criteria will be employed to screen key personnel, such as scientists and engineers, from the Service Callable group to the Selectively Callable category? What proportion of the Selectively Callable reserve will be those with specialized skills and what proportion those who have completed their Service Callable obligation and who may not have any specialized qualification? What machinery will be available to Selective Service to aid in evaluating specialized skills? The Appley Report had recommended that local and state Selective Service boards have the aid of advisory bodies of specialists who are qualified to weigh the value of a specialized person to industry.

The answer to these questions, and many others, will be developed in the specific legislation to be presented to Congress soon, and may be revised by Congress after it hears the testimony of the engineering societies and other organizations representing specialized personnel.

Deferment Policies To Continue

The Defense Department announcement said that under the new plan present deferment policies

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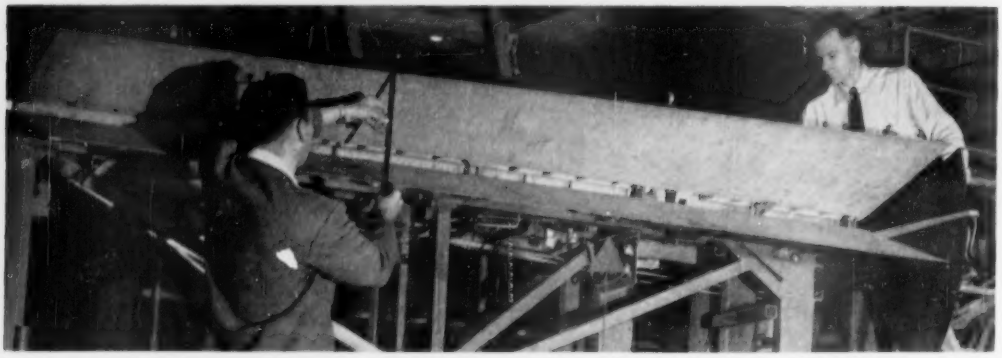
will continue. But it also was observed that everyone is eventually to be called on to serve, "including students deferred through the years of their undergraduate and graduate work." If taken at face value, this statement means that an engineering student who obtains a deferment and then moves into a critical position in industry or engages in vital research work will have to interrupt that work to discharge his military obligation. Presumably, also, such a person could not be screened into the Selectively Callable Reserve by virtue of the previous deferment.

With respect to deferment for graduate study—it was recently reported (AMERICAN ENGINEER, November, 1954) that a Presidential Executive Order had raised the required standards to qualify an individual for graduate study deferment because, according to the White House, it was desired to assure that those deferred for graduate work "possess fully acceptable scholastic qualifications whose development could benefit both the Nation and the individual." Now, however, the Selective Service System has published a statement explaining the change which clearly indicates that the "tightening up" was designed also to reduce the number eligible for such deferment. "With the increasing numbers attending graduate schools, the feeling was growing that graduate schools were



Draft Director Hershey sees more draft deferments in months ahead.

being used as a possible means to delay service. This widespread feeling was beginning to undermine public confidence in the entire student deferment program." The Selective Service statement also endorsed the point made by the President, stating ". . . that the Nation's needs could be met better by quality people than by quantity."

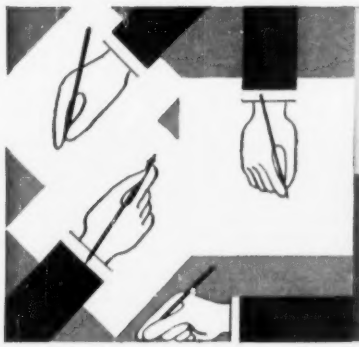
Draft Director Lewis B. Hershey has now announced that he expects more draft deferments to be granted in view of the President's decision to cut the armed forces by 430,000 men over the next 18 months. The February draft call has been cut from 20,000 to 11,000 and this type of reduction is expected to be maintained if the cut in the armed forces stands. Some members of Congress have expressed concern over the reduction and may challenge the move when the new manpower program comes before the Congressional committees.

High Level Policy Involved

The new manpower plan is so closely related to the other aspects of the total defense plan of the nation that it cannot be considered by itself. For example, in commenting upon the reduction of the number on active duty in the armed services, Secretary of Defense Wilson stated that the cuts are in line with the Administration's belief that the threat of global atomic war has diminished in recent months. Secretary of State Dulles, however, commented that the cutbacks can be attributed to this country's technological advances. The two statements are not necessarily inconsistent, but they do raise this question: If the danger of war has lessened because of the mighty retaliatory power of the United States brought about by technological achievement, can that technological supremacy be maintained, or the lead widened, if policies do not recognize the unique place of engineers, scientists, and other specialized personnel in the scheme of total defense?

A committee of 13 members of the American Council on Education has within the past few days reported that "the progress and security of the Nation may be in jeopardy" through neglect of basic research in the wake of World War II. The committee, made up of educators and scientists, said: "The committee is fearful that, since World War II, proper emphasis on basic research has not been maintained and that this trend is reflecting itself both in the quality of scholars being turned out at the present time and in the diminished contribution to fundamental knowledge on which future applications and development must be based; hence, the progress and security of the Nation may be in jeopardy."

If this comment is sound, should any roadblocks be put in the way of more, instead of less, graduate study? Should there be an insistence that all specialized manpower must serve in the armed services at some time, even though such persons may be engaged in vital defense work or research?



Professional POSTSCRIPTS

Happy New Year and —PP— does hope you had the Merriest Christmas ever! Our mail has contained little besides Christmas cards the past few weeks, but a few items have come in that we want to pass along. First, we'd like to print portions of a talk given recently before his group by Walter H. McCartha, President of the District of Columbia SPE. We think you'll agree with many of the points that Engineer McCartha makes.

—PP—

When a successful politician wants to improve his position in society he runs for a higher public office. His campaign is conducted in a most forceful manner to make his fine record and his great ability known to the voters. Many engineering societies who shun the promotion of engineers' economic interest need to look at the politician's campaign techniques.

Why are engineers as a group so timid when it comes to advancement of their own welfare? They will work and expend their own money to promote the public welfare by protecting the public against incompetent engineers. But as a group, they shy away from promotion of their own financial betterment. I wish here and now to definitely state that I believe engineering societies need more forceful professional programs to improve the engineers' economic status.

Do engineers as individuals and as a group need more monetary income? In my opinion, the answer is definitely yes. Year after year we hear of the shortage of engineers and remedies to relieve it. But few of our leaders ever mention the possibility of more pay turning the trick. The National Society of Professional Engineers, in summarizing the results of their "Income and Salary Survey of 1952-1953," states, "Except for administrative and sales work, most engineers, no matter how experienced, earned less than $10,000.00 in 1952." It further states, "For the more experienced engineer in particular, employment in industry or the conduct of private practice is much more profitable than association with governmental agencies or educational institutions." This survey indicated that engineers employed by county, city, and state governments were lower paid than engineers in college teaching.

The survey showed many inequalities in the pay of engineers. Civil engineers' salaries as a whole were exceedingly low. Many of these fine civil engineers are employed as waterworks and sanitary engineers, and should they leave for better pay, a definite hazard to the public health could develop. Some readers are old enough to remember the typhoid fever epidemics in years gone by. They were caused by impure drinking water. . . .

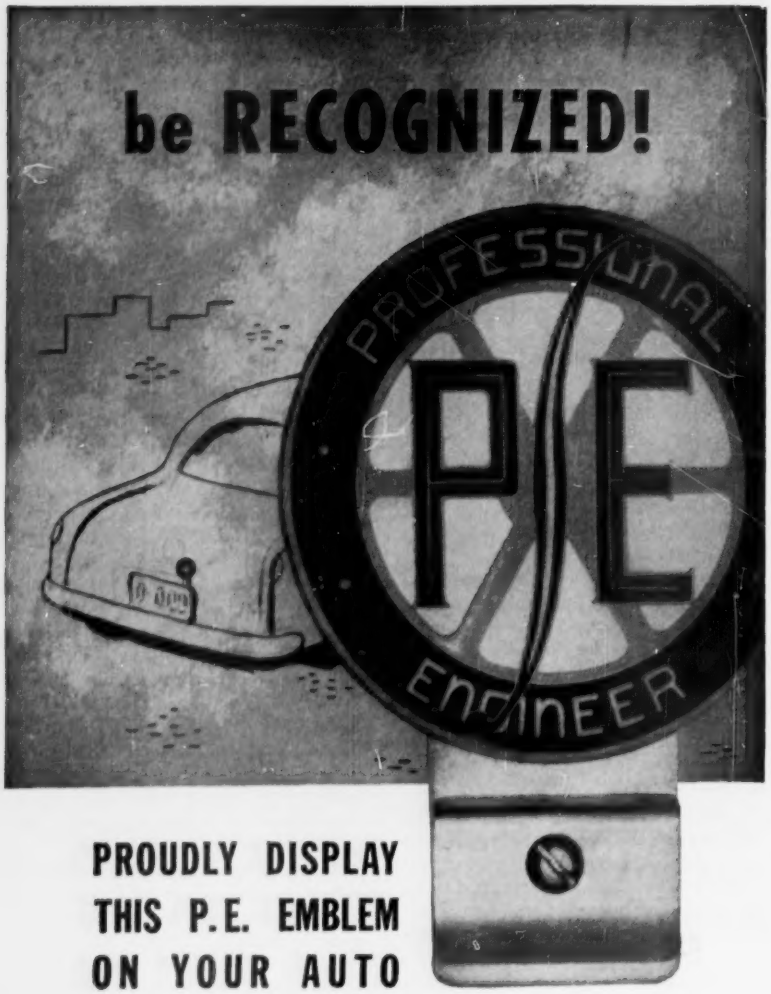
The engineers' group reluctance toward promotion of their own economic welfare is now being exploited by the unions to unionize engineers. And make no mistake, these unions are deadly serious and mean business. They are beginning to hit pay dirt, for in two short years the Engineers and Scientists of America, known as ESA, have forged a union 40,000 engineers strong by bringing together many small weak independent unions. From lack of proper professional recognition and lack of adequate monetary income many engineers turn to the unions. A recent survey made by the American Society of Civil Engineers indicated that 25 per cent of all engineers favor unionism. When this many engineers favor unionism, it seems reasonable to believe that the engineering societies are failing to fully meet the engineers' professional needs.

Space does not permit me to give you all of the reasons why I believe that engineers should not be unionized; but our great engineer thinkers such as Harry A. Winne of General Electric are convinced that engineers should be identified with management instead of labor. If engineers aspire for promotion into the upper echelons of industrial leadership, then they by all means must identify themselves with management. As more engineers occupy important managerial positions, management will better understand the need for professional recognition and financial well-being of engineers. The old saying, "If you can't beat them, join them" is so true here. The foremen in industry consider themselves as part of management and have rejected unionism. Engineers who furnish the technical brains for industry can learn a lesson from these foremen. *Business Week* magazine states that managment would prefer to hear about the engineers' economic problems from their professional societies, rather than from the unions. I recently read a statement in an engineering magazine, that they are fighting unions. What a mistaken and tragic approach to the problem. Engineering societies must offer a better program for the engineers' needs. *This must be our answer to unionism.* If engineers are to take their rightful place in governmental and industrial management, we must be sympathetic toward and understand how to work with unions, for laborers, mechanics and other craftsmen all need unionism.

If you are not convinced that engineering societies need forceful professional programs to improve the engineers' economic status, then take a look at the medical profession and its American Medical Association. The medical profession has promoted its own financial and professional status until today it is probably the highest paid professional group. In this process of gaining complete professional recognition and financial independence, have doctors jeopardized progress in medical science? Have they caused a reduction in medical care of patients? The answer appears to be no, for today medical science has reached its highest technical advance and expert medical care is more available to the people than ever before. The American Medical Association uses publicity and legislative lobbying to great advantage. With these tools, they have been successful in fighting socialized medicine which would reduce the doctors' professional recognition and monetary income.

The A.M.A. went to bat for the doctors of the Veterans Administration, and as a result the Government increased these doctors' pay to attract the best qualified men. A real career program was enacted into law for Veterans Administration doctors.

Have not engineers contributed to



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society as much as the medical profession? I believe we must agree that they have. Look at the great bridges, skyscrapers, dams, and super highways to mention only a few of their more visible accomplishments. We are told that the engineers' application to scientific discoveries made the atomic bomb possible. Though engineers' contributions to society have been as great as those of the doctors, the engineers professional recognition and financial rewards are far under those enjoyed by the men of medicine. Let us go forward with a positive and forceful program to improve the engineers' economic and professional status. Remember if we are to scale the heights, it is necessary to build upon the good foundations already laid by our engineering societies:

(1) These societies have established and maintain uniform and fairly adequate fee rates for engineers engaged in private practice.

(2) They have advanced the professional recognition of engineers which in turn aids immensely in improving income.

(3) The National Society of Professional Engineers has advocated the improved utilization of engineering manpower, which in turn will improve the engineers' financial rewards.

(4) N.S.P.E. has shown industry and government how to keep communications open between administrative officers and engineers.

(5) Our National Headquarters has started a very vital program for engineers in industry. This effort is known as the "Engineers-In-Industry Committee." Its purpose is to improve the economic and professional status of engineers in industry and to make them a part of management. This endeavor is in its infancy. It can be, if properly developed, a pilot program for later application to Government and other employment areas.

(6) The National Society has had able leadership and has developed into a real professional society, until today it is respected by Government, industry and the press.

(7) The N.S.P.E. is sponsoring legislation to exempt engineers from the restrictions of the Taft-Hartley Law and to allow complete freedom of association between engineers and management. The engineer unions are opposed to this freedom of association. I am told that the unions plan to introduce into the next Congress a bill to prohibit this freedom of association.

To build upon the foundations already laid will require time consum-

ing effort and thought. We will learn by trial and error. But we should not waste time and should push continuously forward. There are a few guide posts to help us on our way. Let us give consideration to these:

(1) The program of economic improvement must function on the national, state and local level to be effective. Don't expect the National Society to do it all for you.

(2) The program should be for all engineers, and I mean *all*.

It must be for engineers in industry, government, private practice, in teaching and wherever engineers are found. It must be an effort "One for all, and all for one."

(3) Engineers need to solicit aid from the scientists to develop a common cause, as there is great strength in numbers.

(4) The program should employ proper lobbying in legislative bodies at local, state and national levels.

(5) The Civil Service agencies at our various government levels should be educated to give engineers more professional recognition, and to require a professional engineer's license as a qualification for key engineering positions. They already require this for medical and legal positions.

(6) Promote legislation, and most important of all get it passed, to establish adequate salaries and a real career service for engineers in local state and federal governments and for engineers teaching in Public supported colleges and universities. Such beneficial legislation has already been enacted into law by Congress for doctors of the Veterans Administration and for officers of the armed forces.

(7) Employers should be encouraged to help young engineers to take post graduate work, by granting leaves of absence and giving financial aid. The colleges, universities and armed forces have already blazed the trail here.

(8) The program should operate at the local level to aid individual engineers in solution of their problems.

(9) After the program is formulated, give it skillful publicity to get the good will and help of the public. Sell the program to engineers outside of our engineering society.

(10) The program must be sincere and dignified and for only the just needs of engineers. It must not become greedy.

Business Week magazine states that engineers prefer help from their professional societies if they can obtain it there. Let's start with our own State Society and not wait for others to lead us.

—PP—

The current issue of *Harper's Magazine* carries an article entitled, "The Trouble with Engineers." It's a good, well-written piece, and, although we cannot agree with many of the positions presented by the author, some are worthy of thought. We use below the last paragraphs of this piece, but we recommend that you read all the article in the current issue of *Harper's*, and then let us know what you think of it.

—PP—

The need for engineers in the mid-twentieth century is not merely for more of them, but for more of them who can fit effectively into the non-engineering world. Attempts to force-feed the profession, or artificially to elevate its prestige, can only mean a progressive withdrawal by engineers from society's going concern. Scorn, antipathy, or indifference before the demands of bargaining, persuasion, debate, and compromise will eventually result in a loss both of status and of voice for the very men on whom a technical civilization must heavily depend. Their need is for an ability to visualize the culture in which they live—not as a collection of castes in which theirs alone is custodian of the public weal, but as a moving balance of interests that naturally conflict, intermingle, and change. They must undo the damage of an education which treats engineering as knowledge, and engineers as individuals, as though they could not be identified with the real needs and aspirations of the rest of society.

Already numerous engineering schools have turned their efforts in this direction. Among the admirable results has been increasing use of a combined plan, by which students can take three years at a liberal arts college and then transfer for the remaining two years to an engineering institution. Each of these graduate schools may associate itself with a number of colleges; as Columbia has done with forty-three. Carnegie Tech with twenty, MIT with fifteen, Rensselaer Polytech with thirteen, Case and Illinois with ten, and so on. The student receives in college enough mathematics and science to prepare him for advanced study, but at the same time he gets the humanities, arts, and social sciences that few specialist schools could possibly provide. At the end of five years, he is given two degrees—a Bachelor of both the Arts and Sciences. This, in the long run, is a more promising solution for the engineer "shortage" than any other I have seen proposed.

Clearly it is not the way to beat the Russians at the game of Who's Got the Most Engineering Graduates? But we have had enough experience with industry to know that mere numbers are not the answer. Technical society is not measured in its productivity of degree-holders, but of goods and services; and no one of its parts is more essential than the interplay of every part with every other. Most important of all, the contest for technical pre-eminence must not lead us into the trap of encouraging that type of technician who has been called the "skilled barbarian"—the specialist tightly fitted into his own slot and serenely indifferent to the "unscientific" turmoil in which the rest of us live. Such a luxury, in 1955, we can ill afford.

Idaho Society of Professional Engineers—Annual Meeting. January 15-16, 1955. Boise, Idaho.

Texas Society of Professional Engineers—Annual Meeting. January 19-21, 1955. Baker Hotel, Dallas, Texas.

Kansas Engineering Society—Annual Meeting. January 20, 21, 1955. Baker Hotel, Hutchinson, Kansas.

Wisconsin Society of Professional Engineers—Annual Meeting. January 27-29, 1955. Schroeder Hotel, Milwaukee, Wisconsin.

NSPE Spring Meeting—February 18, 19, 1955. Hotel Charlotte, Charlotte, North Carolina.

Professional Engineers of North Carolina—Annual Meeting. February 18-19, 1955. Hotel Charlotte, Charlotte, N. C.

Minnesota Society of Professional Engineers—Annual Meeting. February 23, 24, 1955. St. Paul Hotel, St. Paul, Minnesota.

Oklahoma Society of Professional Engineers—Annual Meeting. February 25-26, 1955. Skirvin Hotel, Okla. City., Okla.

Tennessee Society of Professional Engineers—Annual Meeting. February 25, 26, 1955. Kingsport Inn, Kingsport, Tennessee.

Georgia Society of Professional Engineers—Annual Meeting. February 26, 1955. Dinkler Plaza Hotel, Atlanta, Georgia.

NSPE State Presidents' Conference—March 18, 19, 1955. Allerton Estates, Champaign, Illinois.

Ohio Society of Professional Engineers—Annual Meeting. March 24-26, 1955. Sheraton-Gibson Hotel, Cincinnati, Ohio.

Illinois Society of Professional Engineers—Annual Meeting. March 31 to April 2, 1955. Hotel Faust, Rockford, Illinois.

New Jersey Society of Professional Engineers—Annual Meeting. April 22-23, 1955. Essex House, Newark, New Jersey.

New York State Society of Professional Engineers—Annual Meeting. May 12-14, 1955. Commodore Hotel, New York, New York.

NSPE Annual Meeting—June 2-4, 1955. Bellevue-Stratford Hotel, Philadelphia, Pennsylvania.

Pennsylvania Society of Professional Engineers—Annual Meeting. June 2-4, 1955. Bellevue-Stratford Hotel, Philadelphia, Pennsylvania.

Michigan Society of Professional Engineers—Annual Meeting. June 9-11, 1955. Gratiot Inn, Port Huron, Michigan.

book looks

The Book: Legal Guide for Contractors, Architects, and Engineers

The Author: I. Vernon Werbin

The Publisher: McGraw-Hill Publishing Co., 330 W. 42nd St., New York 36, N. Y.

Price: $5.00

Reviewing the Book: Samuel I. Sacks, P. E., and Attorney at Law, and NSPE Legal Counsel

LEGAL GUIDE FOR CONTRACTORS, ARCHITECTS AND ENGINEERS by I. Vernon Werbin is not a legal guide in the text book sense covering the general principles of contract law. Actually it, as the fly leaf notes state, describes 83 situations or pitfalls which have occurred in actual litigation in recent years involving contractors in most instances.

Only four instances are cited dealing specifically with architecture. None as to engineering. Of course in every construction contract an architect or engineer is a party, yet he is not the causa belle of the principle involved.

The book is, in reality, an enlarged supplement to *Legal Phases of Construction Contracts*, by the same author, published in 1946, in which "the author discussed forty-six legal problems that commonly arise out of construction contracts." These forty-six instances are listed in the appendix of *Legal Guide*.

The list of cited cases and index at the end of the book are of great assistance, particularly to lawyers. The instances cited follow no pattern nor are they related one to the other. They are actual cases which have been reported and which enunciate or sustain the principle or principles cited in the caption. The cases are well selected by the author who is both a lawyer and licensed professional engineer.

"The book is written to be easily understood by laymen as well as attorneys." Most of the illustrations consist of substantial quotes from the case involved or from cited cases illustrative of the principle involved. The legal research on each point is thorough and the instances cited are a boon to any attorney having a similar situation at hand.

Thus, in one case, *Sgarlat v. Griffith*, 349 Pa. 42 (1944), illustrative of the principle "where contract provided for extra payment for excavating rock which would require removal by blasting, contractor was entitled to recover extra compensation for rock removed by a jack hammer which could have been removed by blasting but for danger to adjoining buildings" practically the entire case is quoted.

Again, under the heading of "construction of cost-plus contracts" the legal research evident is excellent. Practically every important case covering this point is cited. Pertinent quotations or the particular point on the subject matter in each citation is set forth. Altogether this illustration is one of the most comprehensive dealing with cost-plus contracts. Anyone about to enter into cost-plus contract would do well to read this article covering twelve pages as a prologue and epilogue.

While the principles cited are general ones applicable in most states, care must be taken to find out whether that principle applies or not in the home state of the reader. This is well illustrated in the situation dealing with "quantum meruit" (as much as it merits). As stated, in some jurisdictions a recovery is allowed where a contractor has failed to perform his contract, on the basis of the fair and reasonable value of the work done or for the difference between the contract price and what it will cost to remedy defects or to complete the contract. In other states where the contractor has breached his contract or has failed to substantially perform his contract he cannot recover. The injustice of the latter position is evident. Suppose a contractor has performed 50 per cent of his contract and has been paid nothing; under a strict interpretation of the latter principle he could not recover anything. However, any court would realize the injustice of the situation and either under the principle of unjust enrichment would allow a "quantum meruit" recovery or would allow a deduction from the contract price of the cost to complete and award the difference. As lawyers say, "the days of Lord Coke" are gone. Harsh as they may appear at times, our courts do attempt to mete out justice. As they frequently have said: "Inexact justice is preferred to exact injustice."

Care, too, must be taken, in using lower court cases as authority, to see whether they have been reversed by an appellate court. An apt illustration is the *Sgarlat* case, above, which reversed the lower court and an appellate court of limited jurisdiction.

The two books being companion books are worthy reading and should be on the shelf of all having to do with construction contracts, particularly governmental officers whose decisions mean life or death to contractors.

Meet the Reviewer . . .

Mr. Sacks

Samuel I. Sacks, a native of Wilmington, Delaware, is both a professional engineer and a lawyer. He received a B.S. in civil engineering from the University of Pennsylvania in 1913 and a C.E. degree from the same school in 1916. He received his LL.B. from Temple University in 1925.

Actively practicing law at the present time in Philadelphia, Pennsylvania, Mr. Sacks is general counsel for the National Society of Professional Engineers. He is also a past vice president of NSPE, and he is noted as the author of many articles on the law in its relationship to engineering.

Mr. Sacks, who also acts as a consulting civil engineer in legal matters, is a life member of the American Society of Civil Engineers. He belongs to the Sigma Xi honorary society and is a *membre d'honneur* of the *Society des Ingenieurs Professionels* of France.

Corporate Practice

(*Continued from page* 20)

applied for a New York license, while the application is pending.

4. Persons working as an employee or pupil of a licensed engineer.
5. Persons working as an employee of a county or town on a county road or town highway, or on a public work not exceeding $5000.
6. Any person who is engaged in engineering practice solely as an officer or employee of a corporation in interstate commerce.
7. Any person who is an officer or employee of a public service corporation whose work is solely in connection with its lines and property and is under supervision as to safety and security by legally established regulatory body.
8. Any person licensed as an architect.
9. Any legally authorized person working solely to operate or maintain steam, power, or refrigeration plants.
10. Persons doing small items of construction or alteration work on any building or structure.

Sec. 7209 1. No corporation shall be licensed. Only the following classes of corporations may be registered to offer engineering service.

a. Corporations practicing continually since prior to April 15, 1935, whose chief executive and all persons carrying on the actual practice or designated

as "engineer" are licensed engineers.

b. Corporations constructing or installing machinery or apparatus whose practice is solely for such work by the corporation and is under the direction of a licensed, registered engineer.

2. Partnerships may practice, provided each partner is licensed.

3. Out of state corporations organized and existing prior to April 15, 1935, whose name includes the word "engineers" may do business but may not engage in the practice of engineering in the State of New York.

Sec. 7210 Regents shall have disciplinary powers.

Sec. 7211 Misdemeanors are punishable by fines or imprisonment and all courts of special sessions are empowered to act.

Sec. 7212 Violations will be investigated and reported to the attorney-general for prosecution.

Sec. 7212a Improper practice may be restrained by injunction.

Sec. 7213 Fee and penalties shall be remitted into the state treasury.

Sec. 7214 The Regents will supervise the licensure and practice of professional engineering.

The Proposed Amendments to the Engineering Law

To make explicit the results of their thinking the engineers have drafted a proposed amended law. On the presumption that this law is right and becomes the established law of New York State it may well serve as a model law for the rest of the Nation.

The following amendments are proposed:

1. The covering provision that the practice of professional engineering is the function and responsibility of the individual lawfully licensed engineer.
2. Provision requiring anyone who identifies himself publicly or is identified as a "professional engineer," within the meaning of the statute, to be lawfully licensed and registered.
3. Provision requiring engineers who render services to a corporation or to any other client as an employee, or as a consultant, to be licensed and registered when the public safety is involved in the work.
4. Provision granting the same treatment to out of state "grandfather" (pre-1935) corporations as to New York corporations.
5. Provision to allow engineers to form and operate corporations to furnish services of professional engineers provided all directors and principal officers as well as all persons rendering professional engineering services are at all times individually licensed and registered engineers.
6. Provision for registration of corporations complying with item (5) above. No corporation may use any name or other means indicating that it offers to or is practicing engineering unless it is lawfully registered.
7. Provision requiring the signature and seal of the licensed engineer responsible for the work to be affixed to all drawings and plans, and in the case of a corporation the corporate seal and name to be affixed in addition.
8. Provision authorizing any corporation to include in its billing and to collect for professional engineering services rendered to the corporation by licensed engineers as employees or otherwise.
9. Provision for preparation of shop drawings and supervision of construction by persons authorized by the responsible licensed engineer. (paralleling the architects' law).
10. Provision authorizing the Regents to promulgate and enforce a code of ethics for professional engineers and engineering corporations.

Conclusion

The Education Law is designed to protect the public against persons fraudulently presenting themselves as engineers or practicing on a dishonest, unethical, or irresponsible basis. It guards against persons who are not engineers engaging in the practice. These are the purposes of the law.

After a two years' struggle with those who want to change the registration law, the engineers of New York State are still continuing in the search for what is right. Their interest in this particular case is the public's interest. The representatives of the public in the legislature, who must determine the final answer, are in need of wise, honest, and unselfish advice.

The choice between (a) engineering as a profession requiring state recognition of individual competence and ethics, and (b) engineering as a business open to all, is an important one. The safety and welfare of the public are involved. The choice made in New York will be an important factor in determining if engineering is to continue to be a profession of responsible individuals.—***End.***

Graduate Opportunities At Carnegie Tech

Announcement of the availability of teaching assistantships, graduate fellowships, and research assistantships for the 1955-56 academic year has recently been made by Robert F. Mehl, dean of graduate studies at the Carnegie Institute of Technology, Pittsburgh, Pennsylvania. The specific openings are in the fields of chemical, civil, electrical, mechanical, and metallurgical engineering and in chemistry, physics, and mathematics.

Full information and application forms may be obtained from Dean Mehl's office.

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On the last day of November, a burly, vigorous man came into our advertising offices and asked to see the latest issue of the AMERICAN ENGINEER. He turned to the Professional Directory, saying: "I'm a contractor with a problem of foundations on a steep slope and I need some professional consulting advice from that outfit in Baltimore — Yes, here they are — Whitman, Requardt," and when we handed him a scratch pad, he noted the address. We then asked if we could get in touch with the concern for him and he replied: "Thanks, no. You see I'm driving right over to Baltimore to discuss my problem with them. I know they can handle it for me." At which we replied: "We're sure they can, the Professional Directory lists only qualified concerns . . ." then, as he started for Baltimore, he interrupted: "Yes, I know, they've got to be good to be in there."

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Chapter Activities — D. C. Peters, P.E., Mellon-Stuart Co., Pittsburgh, Pa.

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THE ENGINEERING PROFESSION IN NATIONAL SECURITY

BY PAUL H. ROBBINS, P.E.

Executive Director

N.S.P.E.

THE release recently of the Defense Department's proposal on the allocation of manpower for maintaining the armed services and the reserves, presents the results of far reaching studies within the Executive Branch of the Federal Government and is of primary concern to the engineering profession. These proposals will be presented to the 84th session of the Congress to be written into appropriate legislation. The current selective service law will expire June 30, 1955. Thus, it is apparent that Congress will place the legislation resulting from this proposal high on the list of priorities to be acted upon in the first session. The Defense Department proposal would include not only the selective service legislation but legislation affecting the organization of the armed forces reserves and it is probable that these two aspects of military manpower will be combined in a single piece of legislation.

The committees of NSPE have been diligently concerned with the problem of military manpower and its correlation with the civilian needs of the nation for a number of years. Close coordination of NSPE's studies has been maintained with other engineering and scientific groups and NSPE is cooperating with a joint committee on manpower legislation on which there are representatives of a number of national organizations.

NSPE has prepared a statement on this general problem which has been widely distributed to government officials, other organizations, legislators and various committees concerned with the manpower problem. It is interesting to note that a number of the observations made in this statement, which was adopted by the Society in November of 1950, are finding implementation and endorsement in current discussions. The general policy section of the statement outlines the basic beliefs of NSPE on which it feels a sound manpower policy for the nation must be built. This section reads as follows:

"The objective of the engineering profession in time of international stress must be the development of the means to provide a maximum contribution to the military strength of the nation and the maximum production to support that military strength.

"In the military service it is necessary that the best talent be available to manage and direct the many engineering problems of the armed services. Likewise those charged with military engineering responsibilities must be professionally qualified. No nation is so abundant in technical and professional talent that it can afford to waste the use of such technical skill and professional abilities in capacities below the maximum level at which such skills and talent can serve.

"In the production effort which must support the military service it is necessary that the best and the most in modern weapons and material be made available to the armed services, and at the same time provide a sound base for the civilian economy. This task will require a continuous flow of engineers for training and for obtaining experience to meet the requirements not only of the normal attrition, if the depletion of the technical personnel during an extended period of full or partial military mobilization is to be prevented, but also for the increasing of a rapidly expanding technological economy.

"These objectives must be achieved if the most is to be made of our available engineering resources."

The statement then goes on to present some observations on engineers in the military service, mobilization of professional talent in civilian services, balancing military needs against defense production needs, and the future supply of technical personnel in extended mobilization periods. On the subject of balancing military needs against defense production the following extract from the statement is noteworthy.

"It is axiomatic that the armed forces cannot accomplish their mission without personnel. The decision to induct or not to induct an individual into the armed forces should rest on the answer to only one question. It is: In which location will the individual in question provide the most useful service to the total national defense effort?"

This observation is of course fundamental in the selective service pattern of the nation but it is important for the engineering profession to do all it can to create in the public mind the necessary philosophy that the technological support of our armed services is a vital cog in the defense of our Nation. Members of the engineering profession should be willing to serve where their talents can be best utilized. It is the responsibility of the profession to do all in its power to see that the necessary legislative and administrative safeguards are provided to assure this end result. Members who may wish a copy of the complete statement of the Society on this important subject may secure one by dropping a post card to the National Headquarters requesting a copy of *The Engineering Profession in National Security*.—***End.***

With Our Members . . .

Membership Award to Reading Chapter

The Reading Chapter of the Pennsylvania SPE has set a new record by having received for the third time the Ritchie Lawrie, Jr., Membership Award. Pictured, left to right above, during the presentation ceremony are: Edward Ott, state director; John T. West, Jr., PSPE executive secretary, who made the presentation; David A. Evans, Reading Chapter secretary; Thomas B. Douglass, retiring president; and K. Raymond Titlow, incoming president.

Tennessee Society Plans Engineers' Week Meeting

Members of the Tennessee Society of Professional Engineers are currently busy with plans for the group's annual meeting, which will be held in Kingsport on February 25 and 26.

Under the auspices of the Program Committee, headed by C. L. Fletcher, plans have already been made for the various business and professional sessions, as well as for inspection tours of the following plants: Blue Ridge Glass Corporation, Borden Mills, Inc., Kingsport Press, Inc., Mead Corporation, and Tennessee Eastman Company.

NSPE President Clarence T. Shoch will be the featured speaker at the banquet on February 26, which will be a highlight of the meeting and will also mark the close of the Tennessee Society's Engineers' Week observance.

Members of the Upper East Tennessee Chapter will act as hosts for the meeting, and visiting engineers from other state societies will be welcome to attend. Full information may be obtained from Registration Chairman V. O. Marshall, 814 Forest St., Kingsport.

Headquarters for the meeting will be at the Kingsport Inn.

New Officers In St. Louis

Newly-elected to take over the administration of the St. Louis Chapter of the Missouri SPE on January 1 are: Walter P. Rathell, president; John T. Heard, Sr., vice president; J. A. Harvie, secretary, and C. A. Schemm, treasurer. H. B. Freeman and M. E. Taylor have been elected to three-year terms as chapter directors, and J. G. Parmely has been elected director-at-large.

The history of the St. Louis Chapter recently was the subject of a feature article in the *St. Louis Daily Record*.

San Diego P.E.'s Promote Legislation

A delegation from the San Diego Chapter of the California SPE recently called on State Senator Kraft to discuss the need for improvements in the current State registration law. Senator Kraft is vice chairman of the State Legislative Committee for Professional Registration.

Members of the San Diego delegation were: J. A. Lederer, chairman of the chapter's Legislative Committee, R. Conrad, C. Morgan, J. N. F. Bischoff, and E. A. Bales, who is president of the chapter.

W. H. T. Holden, president of the State Society, and Earl Buckingham, a member of the CSPE Legislative Committee, also accompanied the group for the purpose of joining with Mr. Lederer in presenting Senator Kraft with a seven-point resolution concerning amendment of the registration law, which was originally adopted by the Los Angeles and Pasadena Chapters and later by all other California chapters. The resolution was based on an idea first suggested by Mr. Lederer

Philadelphia Convention Offers Opportunity To Exhibitors

The NSPE Annual Meeting, June 2-4, 1955, at the Bellevue-Stratford Hotel in Philadelphia, will feature many exhibits.

An ideal opportunity is, therefore, afforded exhibitors who want to put their story across to engineers and surveyors who buy and specify from all over the nation. In addition, engineers from other societies with chapters in Philadelphia or the Delaware Valley area are being invited to inspect the exhibit booths.

The booths are available at $100, $135, and $170; and space is being allocated in order of application. Copies of the Exhibit Brochure and application form may be obtained from: Howard H. Sheppard, Chairman Exhibits Committee, c/o Rumsey Electric Company 1007 Arch Street Philadelphia 7, Pennsylvania

Wisconsin P.E.'s Plan Twelfth Convention

How the American Medical Association and the American Bar Association serve their members, will be discussed at the Saturday luncheon of the Wisconsin Society of Professional Engineers' Twelfth Annual Meeting, to be held at the Schroeder Hotel, Milwaukee, Wisconsin, on January 27, 28 and 29. Guest speakers at this luncheon will be Leo E. Brown and Don Hyndman, directors of public relations of AMA and ABA respectively.

Other guest speakers will be Dr. Fred A. Replogle, of Rohrer, Hibler and Replogle, industrial psychologists of Chicago, Illinois, at the Friday evening banquet and Dr. Allen Abrams, Vice-President, Marathon Corporation, of Rothschild, Wisconsin, at the Friday luncheon.

. . . more news on page 35

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Restricted to Registered Professional Engineers . . . Directory Continued on Next Page

San Jacinto P.E.'s Elect 1955 Officers

Announcement has recently been made of the election of new officers for 1955 by the members of the San Jacinto Chapter of the Texas SPE. Installation of the new chapter leaders took place during the group's annual dinner meeting held December 18 at the University of Houston.

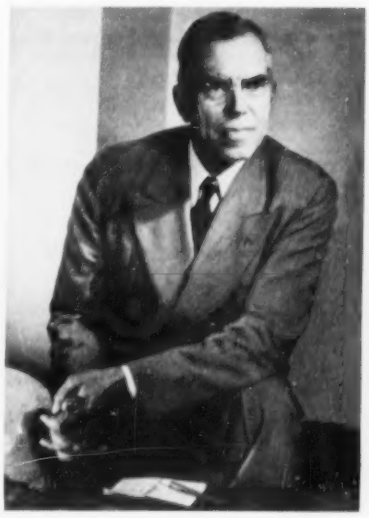
The new officers are: Nat P. Turner, president; M. L. Ray, first vice president; Forrest Daniell, second vice president; T. Spence Love, secretary-treasurer; J. E. Means, state director; and John A. Allison, Albert J. Bonar, E. M. Harris, Harold E. McConnell, and Richard T. McKay, chapter directors.

NEW HONOR FOR WINNE—One of NSPE's most prominent members, Harry A. Winne, whose photograph appears at the right, has been named to receive the 1954 John Fritz Medal which is awarded annually by the four "Founder Societies." Recipient also of the 1954 NSPE Award, Mr. Winne is being cited "for service to his country in war and peace through his distinguished leadership in the electrical industry."

The medal will be presented to the retired General Electric vice president on February 1 during the AIEE winter general meeting in New York.

Texans Pledge Funds For Legislative Fight

Members of the Texas Society of Professional Engineers are currently pledging funds to back the TSPE registration enforcement program. This action is a follow-up to the injunction suit filed recently by the Society (see AMERICAN ENGINEER, November, 1954) in an effort to prove



execution of the Fort Bend County Drainage District's Big Creek proposed drainage program is unlawful because the County did not comply with provisions of the registration law in letting the contract for the work. It is alleged that the plans and specifications for the project were not prepared by a registered P.E. and that, furthermore, work has been initiated without the supervision of a registered engineer, both of which conditions are required by law.

The action amounts to a test case of the registration law, and the Texas Society plans to pursue it to the highest court, if necessary, in order to obtain a ruling which will serve as a guide in further enforcement efforts.

Fox River Valley Group Holds Party

More than one hundred engineers and their wives and guests enjoyed a buffet supper followed by an evening of dancing recently at the Beaumont Hotel in Green Bay, Wisconsin. The party was sponsored by the Fox River Valley Chapter of the WSPE.

John Holloway, acting director of the Brown County Civil Defense Council, was guest speaker.

. . . more news on page 37

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Kansas Eastern Chapter Reports Meetings

A report of a highly successful first meeting of the merged Kansas City groups of the Kansas Engineering Society has recently been received at national headquarters. The proposed Constitution and By-Laws were adopted by the new Eastern Chapter, which comprises the members of the old Eastern Chapter of the KSPE and the Engineers Club of Kansas City of the KES.

At the second meeting of the newly-merged group, held on December 9 at the Holiday House in Kansas City, announcement was made of the results of the election of officers. Those who will direct the Eastern Chapter activities for 1955 are: Paul Haas, president; Vernon Pearce, vice president; Alfred C. Becker, secretary-treasurer; Alfred M. Myers, Jr., state director; and Richard Grant and Henry Holbrook, chapter directors.

Publicity Chairmen . . .

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CIVIL Engr. with exp. in water and sewage works projects or related field. Permanent with old established consulting firm. Northern Ohio. (40-S-2)

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Illinois Engineer Authors Flood Report

William D. Mitchell of Champaign, Illinois, a member of the ISPE and the National Society, is the author of a report on Illinois floods now being distributed by the State Division of Waterways. The report, entitled *Floods in Illinois: Magnitude and Frequency*, was prepared as the result of a cooperative project between the Division of Waterways and the United States Geological Survey, Water Resources Division.

Mr. Mitchell, a hydraulic engineer in the district office of the U. S. Geological Survey in Champaign, holds civil engineering degrees from both Purdue University and the University of Illinois. He has been an employee of the Geological Survey since 1928 and a member of the Illinois district staff since 1939. He also holds membership in the ASCE and the American Geophysical Union.

Copies of the report are available from the Chief Engineer, Division of Waterways, 210 West Monroe St., Springfield, Ill., or the District Engineer, U. S. Geological Survey, 605 South Neil St., Champaign, Ill.

Dinner Meeting Held In Enid, Okla.

Engineers of the Northwest Oklahoma Chapter, OSPE, and their wives met recently for a dinner meeting at the Youngblood Hotel in Enid. Dean Clifford Shirley of Phillips University was the guest speaker for the banquet, and musical entertainment was furnished by the "Velvetones" from Vance Air Force Base.

During the meeting an announcement was made that the Frisco Engine #1519 had been placed on its concrete base in Government Springs Park. The engine, a reconditioned steam locomotive, was donated to the City of Enid by the Frisco Railway Company for a historical monument. Other railroads, local business firms, and the local OSPE chapter, under the leadership of President Loren E. McKee, Enid city engineer, cooperated in making arrangements for the monument, which will be identified by a bronze plaque setting forth pertinent data.

Plans are also going forward for the formation of a ladies auxiliary to the Northwest Oklahoma Chapter, with Mrs. Waldo M. Porr taking charge of its organization.

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February 20-26

STRICTLY BUSINESS

Personalities . . . **Warren H. Chase,** prominent Cleveland engineer and formerly assistant vice president of the **Ohio Bell Telephone Company,** has been elevated to vice president by the company's board of directors. . . . **Armco Drainage & Metal Products, Inc.,** Middletown, O., has announced two promotions in its West Virginia organization. **Robert Williamson, Jr.,** formerly West Virginia manager, has been named assistant to the vice president and will be in charge of long range planning and public relations, making his headquarters in Charleston; while **Edwin Neale Blackwood** has been named West Virginia State sales manager. . . . **J. Austin Miller** has been appointed vice president in charge of Franchises and Sales for **Shana Manufacturing, Inc.,** according to **Harry G. Shaffer,** president of the Chicago heating and air conditioning firm. . . . **Malcolm S. Loring** has been appointed district engineer of the Boston office of the **Portland Cement Association.** . . . **George A. Clark** has joined the **United States Testing Company, Inc.,** of Hoboken, N. J., as manager of its newly-formed Delaware branch in Claymont, Del.

Mr. Chase

Heil Process Equipment Corporation, Cleveland, has announced the appointment of **Fred W. Arndt** as chief engineer. **Peter L. Veit** has also been named direct sales engineer with headquarters in New York. . . . **John D. Griffiths** has been named chief engineer of **Gate City Steel, Inc.,** Boise, Idaho. . . . **Lt. Gen. Harold L. George,** USAF (ret.), has been elected senior vice president of **The Ramo - Wooldridge Corporation,** Los Angeles, according to an announcement by **Dr. Dean E. Wooldridge,** president. . . . **A. Robert Teasdale, Jr.,** has joined **TEMCO Aircraft Corporation's** Engineering Department as chief of electronics design, according to **I. Nevin Palley,** vice president — engineering. . . . Appointment of **D. D. Robertson** and **J. R. Miller** as vice presidents of the **Dana Corporation,** Toledo, O., has been announced by **John E. Martin,** president of the firm. . . . **Admiral Alan G. Kirk,** chairman of the board of the **Mercast Corporation,** New York, has been elected president of the corporation by the board. He succeeds **S. J. Sindeband** who was recently named president of **The Teleregister Company.** . . . **Paul McAdams** and **Walter Ross, Jr.,** both development engineers, have been appointed to the engineering staff of the Construction Machinery Division of **Clark Equipment Company,** Benton Harbor, Mich.

Mr. Griffiths

The Kuljian Corporation, Philadelphia engineers and constructors, has announced several new engineering appointments. **William J. Fadden, Jr.,** has been named chief mechanical engineer; **Daniel H. Dykins** has been appointed manager of utilities; and **Dr. Jaime Fonrodona** has been named home office representative in the Caribbean area. Dr. Fonrodona will have his headquarters in Caracas, Venezeula . . . **Hicks B. Waldron** has been appointed materials specialist of the **General Electric Company's** Distribution Assemblies Department in Plainville, Conn. . . . **Oscar V. Sprague,** well-known mechanical engineer, has become superintendent of the utilities division at the Kodak Park Works of the **Eastman Kodak Company,** Rochester, N. Y., effective January 1. . . . **Bernard P. Thomas** has been named director of the Highway Construction and Materials Department at **The Dow Chemical Company's** Midland, Mich., works. . . . **J. A. Ackermann** has been appointed chief engineer of **The Elwell-Parker Electric Company,** Cleveland, O., manufacturer of power industrial trucks.

Mr. Fadden

Changes of Ownership . . . The assets and business of the **Globe Steel Tubes Co.** of Milwaukee have been purchased by **The Babcock & Wilcox Company** of New York, according to an announcement by both companies. **The Babcock & Wilcox Company** has also announced that it will continue to operate the Milwaukee plant as a part of its Tubular Products Division. . . . The **American-Marietta Company** of Chicago has acquired control of the 74-year-old **Standard Lime & Stone Company** of Baltimore, Maryland. The Baltimore firm, operating nine plants in seven states is a producer of Portland Cement, crushed limestone, and chemical lime. . . . The **American Locomotive Company** has announced in New York that it has concluded negotiations for the acquisition of the business, plant, machinery, equipment, and inventories of the **Central Pipe Fabricating & Supply Company** of Cincinnati, O., from the joint owners—the **H. K. Ferguson Company** of Cleveland and the **Associated Piping & Engineering Company** of Compton, Calif.

Exhibitions . . . The **Twelfth International Heating and Air-Conditioning Exposition,** sponsored by the **American Society of Heating and Air-Conditioning Engineers** (formerly **American Society of Heating and Ventilating Engineers**), will be held January 24-28, 1955, at the Commercial Museum and Convention Hall, Philadelphia, in conjunction with the Society's annual meeting at the Bellevue-Stratford Hotel . . . **The World Plastics Fair and Trade Exposition** has been scheduled for April 6-10, 1955, at the National Guard Armory, Exposition Park, in Los Angeles. **Consolidated Advertising Directors** of Los Angeles are in charge of show management, with **Philip M. Kent** of **World Plastics Fair and Trade Exposition, Inc.,** as managing director. . . . **Clapp & Poliak, Inc.,** of New York has announced that the next **National Materials Handling Exposition** will be held at the International Amphitheatre, Chicago, May 16-20, 1955.

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Surveying Teaching Book Is now Available Through Princeton U.

Announcement has been made that a volume incorporating the *Proceedings of the Third National Surveying-Teachers' Conference* is now off the press. The volume contains the papers presented at the Third National Surveying-Teachers' Conference held at Camp Rabideau, Blackduck, Minnesota, in August 1952, under the joint sponsorship of Committee Eight, Surveying and Mapping of the Civil Engineering Division of the American Society for Engineering Education, and the Civil Engineering Department of the University of Illinois.

Copies of the book may be ordered from the editor, Sumner B. Irish, School of Engineering, John C. Green Foundation, Princeton University, Princeton, New Jersey. Price of the book is $2.50.

U. S. Research Data Is Available

The Technology Division, Office of Technical Services, Department of Commerce, is calling the attention of engineering societies and other similar organizations to the growing stockpile of research reports released by the Federal Government through the OTS. The largest part represents applied research and development, and this research generates a vast amount of non-confidential technical information that is useful in innumerable fields of industrial activity.

Some 350 such reports are described each month in *U. S. Government Research Reports* (formerly *Bibliography of Technical Reports*), which is available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., or any of the U. S. Department of Commerce field offices, at $6.00 per year.

Wage Hour

(*Continued from page* 22)

facture are used, these employees have no part whatever therein. Men and machines are doubtless necessary to the production of goods in a factory and the factory building is doubtless necessary to house the men or machines and the plans may be necessary for the construction or alteration of the building, the activities of the employees in preparing the plans may be said to be necessary to the comprehension of the architectural or engineering advice; but it seems clear that the employees' activities are only very remotely related to the production of the goods."

Applying this reasoning to the case at hand, Judge Riley found that the case was not of a borderline nature, and that: "The connection between what this defendant and his employees do in defendant's primary intrastate operation as a professional consulting engineer, with the activities of defendant's clients as collaterally affecting interstate commerce, is too tenuous to bridge the gap between the two for any practical or rational purposes. The effect of defendant's activities and those of his employees in commerce is too far removed from his main activities to have more than a remotely incidental effect. It is by no means so closely related as to be for all practical purposes an essential part of interstate commerce."

The Government's complaint and application for an injunction was dismissed.

Letters

(*Continued from page* 5)

with critical defense programs. At the same time, the other hand of bureaucracy rules that we independent engineers are subject to Social Security laws and penalties, unlike the doctors, lawyers and ministers who are considered the professionals. In fact, to catch us in the detrimental connotation of "being self-employed" was attached to our profession.

In the meantime the engineering societies, formed by large majority by employees who as such may have little concern for the development of independent professional status, prefer to ignore the hard realities and indulge in all sort of trival activities, awarding of boring testimonials and the writing of meaningless codes, which are legally and physically impossible of enforcement.

If we are ever going to contribute towards the prestige of our noble and high-minded profession, which is regarded with more respect by all the civilized nations than in the United States, we must start acting at once. A revision of the inadequate registration laws, which only constitute an ineffective attempt to circumvent wholesale disbursement of degrees, is mandatory. Furthermore, without sound and substantial teaching programs the engineering candidate that now goes through the mill of around-the-clock classes in overcrowded and deficient quarters, will never be instilled with a sense of professional respect. The mass hiring of mediocre trained personnel to be assigned to limited tasks and routine responsibilities is lowering the profession and wasting the possibilities of developing highly responsible professionals.

Do all these proposals sound too high or out of reach and aims? If we wish to feel so, then we have not the faintest right to deplore and lament the inroads of union organization as we frequently do, and which, if not arrested, will in time destroy any possibility that engineering becomes a free and independent profession in the United States.

M. von Ch. Barraza, P. E.
E. Orange, N. J.

. . . NEW LITERATURE . . .

To help the offering firms determine which literature you require, when requesting an item, be sure to list all specifications shown . . . and say you saw it in the AMERICAN ENGINEER.

WATER CONDITIONING—Technical Reprint T-124, which discusses oil removal from water and methods of de-oiling refinery waste water, is now available from Graver Water Conditioning Co. Discusses some current methods employed to treat several types of water containing oil. Also laboratory and field results and how refinery waste waters are de-oiled for economical reuse. Accompanied by tabular results. Available without obligation from: R. S. Lewis, Advertising Manager, Graver Water Conditioning Co., 216 W. 14th Street, New York 11, N. Y.

—AE—

NON-SHRINK METHOD OF GROUTING (E-lc)—A 16-page folder describing successful grouting of heavy equipment with Embeco non-shrink mortar, has been released by the Master Builders Co. It contains information on recommended mixes and estimating tables, etc. Copies available by writing: The Master Builders Co., 7016 Euclid Avenue, Cleveland 3, Ohio.

—AE—

STAINLESS STEEL—The Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa. offers two bulletins on stainless steel products. One, TDC 162, outlines welding characteristics of both austenitic and ferritic grades and discusses question of proper joint design and various welding methods. Includes table of recommended procedures. The second bulletin, TB 356 outlines methods of bending and joining stainless pipe and discusses the problem of light wall versus heavy wall pipe. Request by number.

COOLING TOWER TESTING — "Test Your Tower," a new 20-page booklet by the Marley Company describes a simple direct method by which industrial cooling tower performance can be tested. The method outlined is said to be simpler, more direct and more conclusive and requires a minimum of apparatus and effort. Every step has been checked and rechecked in hundreds of actual applications and results are said to be conclusive when applied to large industrial towers of all types. Copies of "Test Your Tower" are available on request from Technical Services Department, The Marley Company, 222 W. Gregory Blvd., Kansas City, Mo.

—AE—

COMBUSTION CONTROL — Complete protection against explosion hazards of burning fuel is offered to users of light oil, gas, and combination light oil/gas burners by the new Fireye Combustion Control System FJ-2 announced by Combustion Control Division, Electronics Corporation of America. The system extends to commercial burners, the instant flame detection and flame failure prevention required by new safety codes. Complete specifications, wiring diagrams, and programming sequences are shown in new Fireye Bulletin CF-30. Address inquiries to Electronics Corporation of America, Dept. CN, 718 Beacon Street, Boston 15, Mass.

ARMORED MOTORS BULLETIN—A new full-color, twenty page, publication describing armored motors (direct current types MD and MDP, 600 series) is available from the General Electric Company, Schenectady 5, New York. Designated GEA-4654C, the bulletin provides information on performance and maintenance features of the heavy-duty G-E motors. Included in the bulletin are horsepower ratings and mechanical data.

—AE—

WROUGHT ALUMINUM ALLOY DESIGNATION SYSTEM—A new system of alloy designations for wrought aluminum and aluminum alloys has been developed by The Aluminum Association, 420 Lexington Avenue, New York 17, officially designated as "The Aluminum Association Alloy Designation System for Wrought Aluminum." The temper designations in effect since 1947 are being continued without change and, as in the past, will follow the alloy designations.

—AE—

COPINGS AND GRAVEL STOPS—Four newly-designed aluminum roofing accessories to protect the vulnerable joint between the roof and wall of a building are described in a comprehensive booklet by Aluminum Company of America, 739 Alcoa Building, Pittsburgh 19, Pa. Improved appearance and utility are featured in the new line, which includes: an extruded gravel stop, combining cant strip and fascia band; a gravel stop which forms an integral stop; and two new copings for 12" and 8" parapet walls.

Advertisers' Index

Acme Fire Alarm Co., Inc. 8
Adache & Case, Engineers 36
Aerofin Corporation 38
Albright & Friel, Inc. 36
Alva F. Allen 8
Alvin & Company 8, 38
American Institute of Steel Construction 38
Ark Engineering Company 36
Michael Baker, Jr., Inc. 36
Elmer S. Barrett Associates 36
E. D. Barstow & Associates 36
Bettenburg, Townsend & Stolte 35
J. Paul Bishop & Associates 34
Black & Veatch 35
George W. Brandt, Engineer 36
Roger Barrett Bross 34
Brown & Blauvelt 35
Builders Estimating Service 37
C. L. Calkins 34
Capitol Engineering Corporation 36
Commonwealth Associates, Inc. 34
Consoer, Townsend and Associates .. 34
Cormit Engineering Company 37
Crescent Engineering Company, Inc. . 34
Geo. F. Deatherage & Son 38
DeLeuw, Cather & Company 34
Thomas E. Duce Associates 37
Eastern Heat Treating & Brazing Corp. 37
Ehrco Die Casting Service 37
Engineers Testing Laboratory, Inc. .. 37
Eustis Engineering Company 34
Fay, Spofford & Thorndike 34
Orrin E. Fenn 34
Ferguson-Gates Engineering Company 37
Forrest and Cotton 37
Foster & Cafarelli 35
Frazier-Simplex, Inc. 36
Freese & Nichols 37
Gannett, Fleming, Corddry & Carpenter, Inc. 36
Gustave M. Goldsmith 36
Greer & McClelland 35
Hall Laboratories, Inc. 36
Alexander Hamilton Institute 5
Frank E. Harley & Associates 35
Frederic R. Harris, Inc. 35
C. M. Hathaway 34
The Hinchman Corporation 34
Howard, Needles, Tammen & Bergendoff 35
Kaiser Engineers 34
Kennedy-Riegger Drilling Co., Inc. .. 37
Kirk & Cowin 34
Knappen-Tippetts-Abbett-McCarthy .. 35
Kuljian Corporation 36
Law-Barrow-Agee-Laboratories, Inc. .. 34
Lawrie & Green & Associates 36
Louis J. Lucas 34
Madigan-Hyland 36
Emmet J. McDonald 36
Metcalf & Eddy 34
Merritt & Welker 34
Maurice P. Milliken 36
Modjeski and Masters 37
Niagara Blower Company 7
H. C. Nutting Co. 36
James P. O'Donnell 36
Oklahoma Testing Laboratories 36
Palmer & Baker, Inc. 34
Parsons, Brinckerhoff, Hall & Macdonald 36
Radio Corporation of America 4
Revolvator Company 4
Cyrus Wm. Rice & Co., Inc. 37
Robert and Company Associates 34
Lloyd N. Robinson 37
F. A. Sando 34
Seelye, Stevenson, Value & Knecht .. 36
Singstad & Baillie 36
W. W. Slocum & Co. 35
South Florida Test Service 34
D. B. Steinman 36
Max Stern, P.E. 37
Syska & Hennessey, Inc. 36
Toledo Testing Laboratory 36
United States Testing Company, Inc. . 35
Emerson Venable 37
Warren-Knight Co. 6
Water-Tight Underground Conduit .. 37
Wilton Smith Whipp 37
H. P. White Lab. 34
Whitman, Requardt and Associates ... 34
A. W. Williams Inspection Co. 34
Wilson & Company 34

What's New

AMERICAN ENGINEER Jan., 1955
1121 FIFTEENTH ST., N.W., WASHINGTON 5, D. C.

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NEW BINOCULAR ATTACHMENT — *Item 1*

Harry Ross announces "Bino-Tach" for all binoculars, especially extra-high-powered types. Simple construction, rugged. Improves "seeing," reduces fatigue. Fits every make and size of prism binocular. Fits regular photo panhead, tripod or tripod accessory. On or off in seconds. No tools required. Holds glasses firmly. No shake, no blur. Makes possible use of prism binocular as a tele-photo lens.

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HYDRAULIC HOSE AND COUPLINGS — *Item 2*

Joy Manufacturing Company announces a new line of hydraulic hose and couplings, tradenamed "Surgepruf," for medium-high and high pressure service. The couplings, manufactured to J. I. C. standards, feature a "double-wedge" grip which, the manufacturer claims, makes possible assembly on rubber covered hose without skiving. A special slotted bushing makes possible retightening the Surgepruf coupling on the hose without disassembly when and if it comes loose through vibration or flexing. No special tools or mandrels are required for assembling Surgepruf couplings on the hose.

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VERTICAL MILLING MACHINE — *Item 3*

The Jackson Machine and Tool Company Sales Division announces the Jackson High Speed Vertical Milling Machine incorporating new features including three rates of power down feed to the spindle and optional power feed to the table with infinitely variable speeds. Has six spindle speeds ranging from 220 RPM to 2300 RPM. Power down feed rates are .0017", .003" and .0053" per spindle revolution. Full range of manual feeds including both fine and lever type.

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PLASTIC COTTON AND GLASS CLOTHS — *Item 4*

Geo-Optic Co., Inc., has available new plastic sensitizing and tracing media, Polyester Cotton and Glass Cloth. Cotton Cloth has a fabric of an entirely new blend of American and Egyptian cotton fibers woven to a thickness of .0025". Waterproof, eliminating special coating operations. More uniform, more transparent than starch cloth. Much better dimensional stability. Glass Cloth has a fabric woven from continuous glass fibers .004" thick. Dimensional stability is said to equal aluminum. Flexible, transparent. Permits scale drawings.

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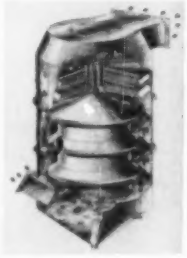
PORTABLE STOVE, DISPOSABLE FUEL TANK — *Item 5*

A new portable Camp Stove utilizing a disposable liquefied petroleum fuel tank has been developed by The Turner Brass Works. Its light weight (6 pounds), compactness, and economy of operation make it ideal for on-the-job field-service use, camping, trailer or cottage use, or as a "stand-by" emergency stove for homes. No pumping, priming, or warm-up required, even in sub-zero temperatures. Lights instantly. Burns with a clean, hot blue flame without soot, smoke, fumes or odors.

This column describes new products of general interest to professional engineers. For further information, fill in the coupon provided and mail to the AMERICAN ENGINEER.

WET-TYPE DUST AND FUME COLLECTORS — *Item 6*

Van-Turner Company, Inc., has developed a wet-type dust and fume collector based on a new operating principle. Consists of a cylindrical drum with a series of cones and baffles. Water, supplied by a direct driven pump, cascades downward within the collector, producing a series of closely related water curtains through which the dust-laden air is filtered in its upward travel.



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LIGHT-WEIGHT NEOPRENE-TO-NYLON TARPS — *Item 7*

A light-weight, long-lived tarpaulin material of nylon and neoprene synthetic rubber is now being introduced by Du Pont Company's Fabrics Division. Medium weight "Fairprene" tarpaulin has a proved life expectancy twice that of #8 treated duck in common use and is expected to go higher, based on current tests. Tear resistance four to six times greater. Will not shrink. No added weight through water absorption in wet weather. No seepage. Will not rot or mildew when stored wet.

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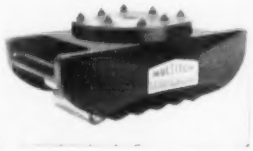
SELF-LAYING TRACK DOLLY — *Item 8*

Stokvis-Edera & Co., Inc., has placed on the market a new, ingenious device known as the Multiton Roller Skid for heavy moving of machinery or equipment. Extremely powerful, yet light. Designed specifically for inordinate weights. An endless chain composed of heavy steel rollers joined by link courses around the center piece of the frame. Turntable is furnished with gripping "teeth."



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SILVER BRAZING ALLOYS AND FLUX — *Item 9*

The Air Reduction Sales Company has just announced the new Aircosil products—a brand new and complete line of silver brazing alloys and flux for all types of production jobs. Aircosil alloys are available in various forms—rod, wire, sheet, rings and gaskets, as well as special shapes. Alloy of special composition to fit any production requirement are also available. The new Aircosil silver brazing flux is in paste form and will not freeze, crystallize nor separate and the residue rinses off easily in hot water.

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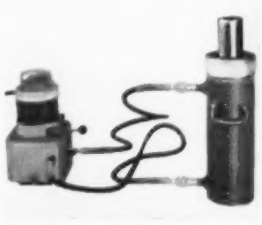
HYDRAULIC JACK AND PULLER — *Item 10*

A new 60-ton hydraulic jack and puller with a separate hand or motor-powered pumping unit has been announced by Templeton, Kenly & Co., for heavy-duty jobs. Hydraulic ram can be both raised and lowered by power. Permits faster retraction. Ram positioned quickly. Called Model RP798CO-6010 Re-Mo-Trol. Has a 10-in. travel. Equipped with Simplex "Center-Hole" for easier pulling. Can be remotely located for operator safety and easier use in cramped quarters.



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She shot the ashes off the Kaiser's cigaret

Her name was Phoebe Mozee and she was born in Darke County, Ohio, in 1860, and she could shoot the head off a running quail by the time she was twelve years old.

Once, at the invitation of Kaiser Wilhelm II of Germany, she knocked the ashes off a cigaret while he was holding it in his mouth.

When she out-shot the great exhibition marksman, Frank Butler, he fell in love with her and married her and they were ideally happy together for the rest of their long lives.

She could handle a rifle or a six-gun with an artistry unsurpassed by that of any human being before her time or, probably, since. And when she appeared with Sitting Bull and other notables in Colonel Cody's Wild West Show, she thrilled your father and mother—not as Phoebe Anne Oakley Mozee but as "Little Sure Shot," the immortal Annie Oakley.

Annie Oakley, the poor back-country orphan girl who made her way to world-wide fame, was the very spirit of personal independence. That spirit is just as much alive in our generation as it was in hers. It is among the great assets of our people—and our nation. And it is one very great reason why our country's Savings Bonds are perhaps the finest investment in the world today.

Make that investment work for you! Increase your personal independence and your family's security, by buying Bonds regularly—starting now!

★ ★ ★

It's actually easy to save money—when you buy United States Series E Savings Bonds through the automatic Payroll Savings Plan where you work! You just sign an application at your pay office; after that your saving is done *for* you. And the Bonds you receive will pay you interest at the rate of 3% per year, compounded semiannually, for as long as 19 years and 8 months if you wish! Sign up today! Or, if you're self-employed, join the Bond-A-Month Plan at your bank.

For your own security—and your country's, too—invest in U. S. Savings Bonds!

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